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CHEMICAL WEEKLY

VOL. XXXIII JUNE 14, 1988 NO. 40

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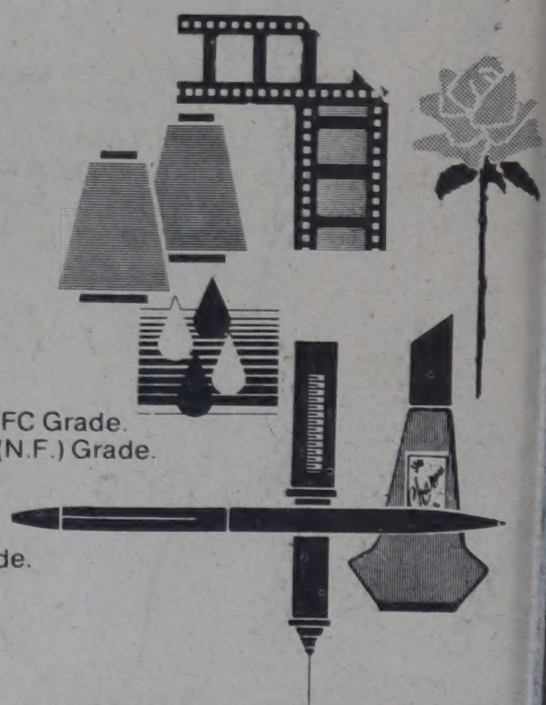

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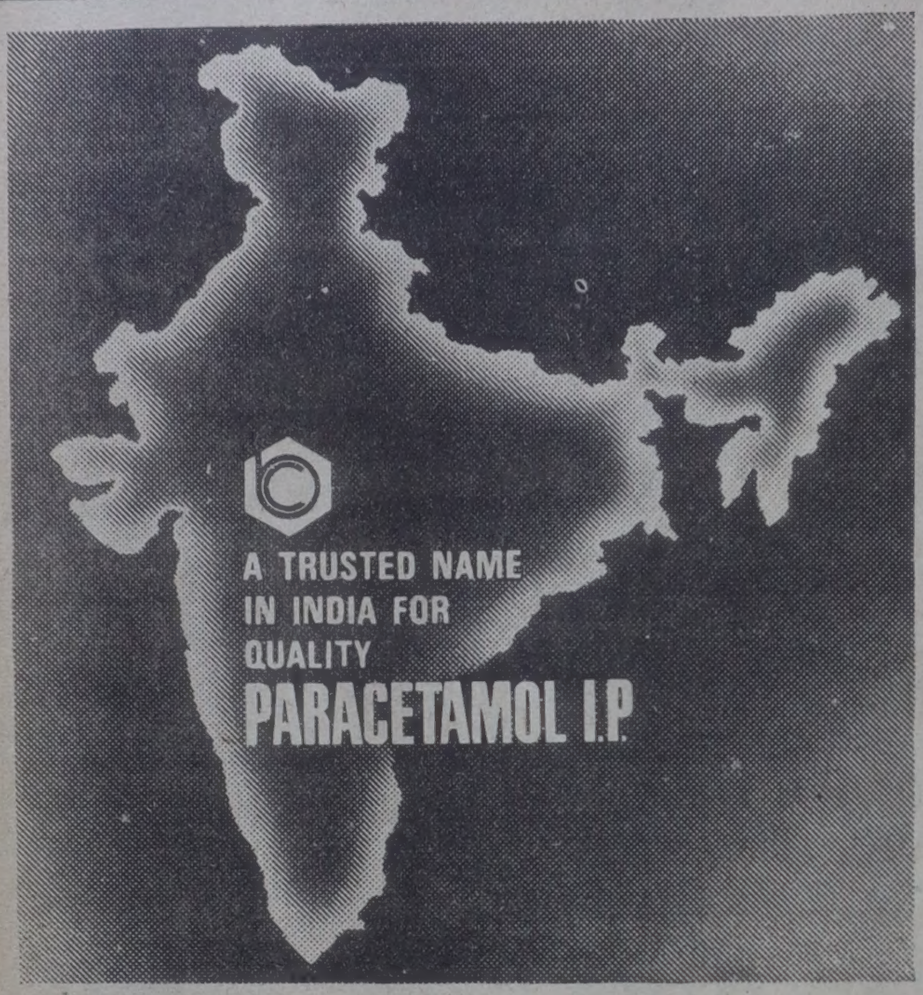

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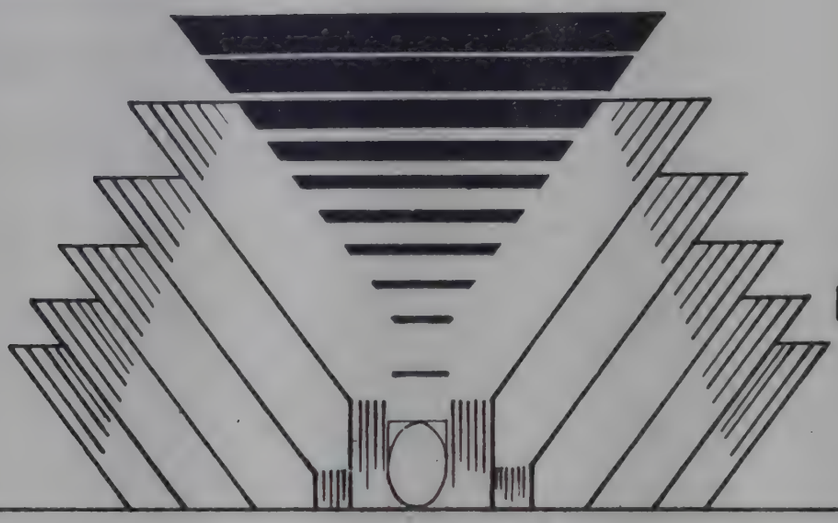

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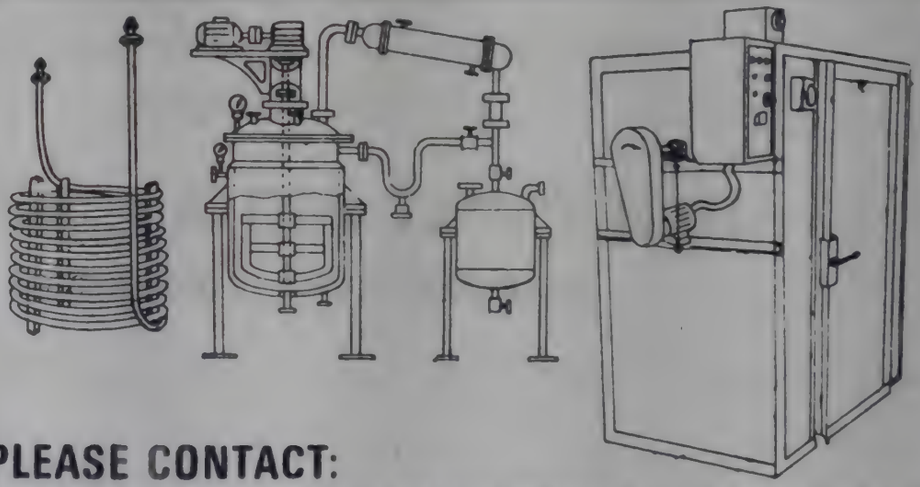

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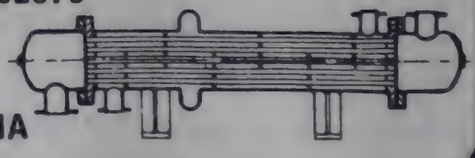

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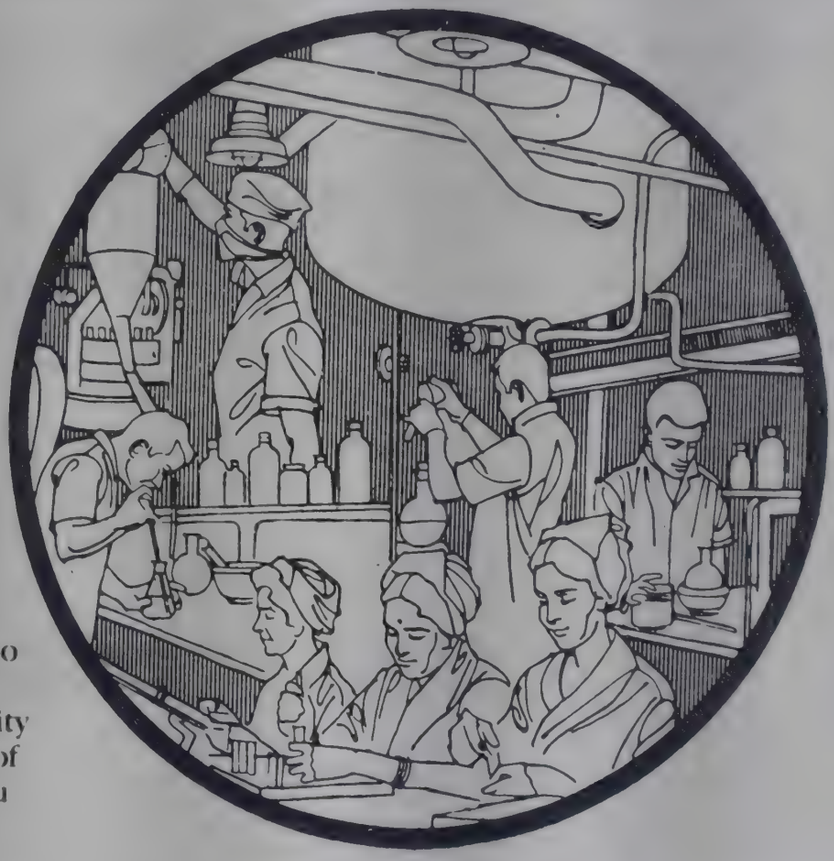

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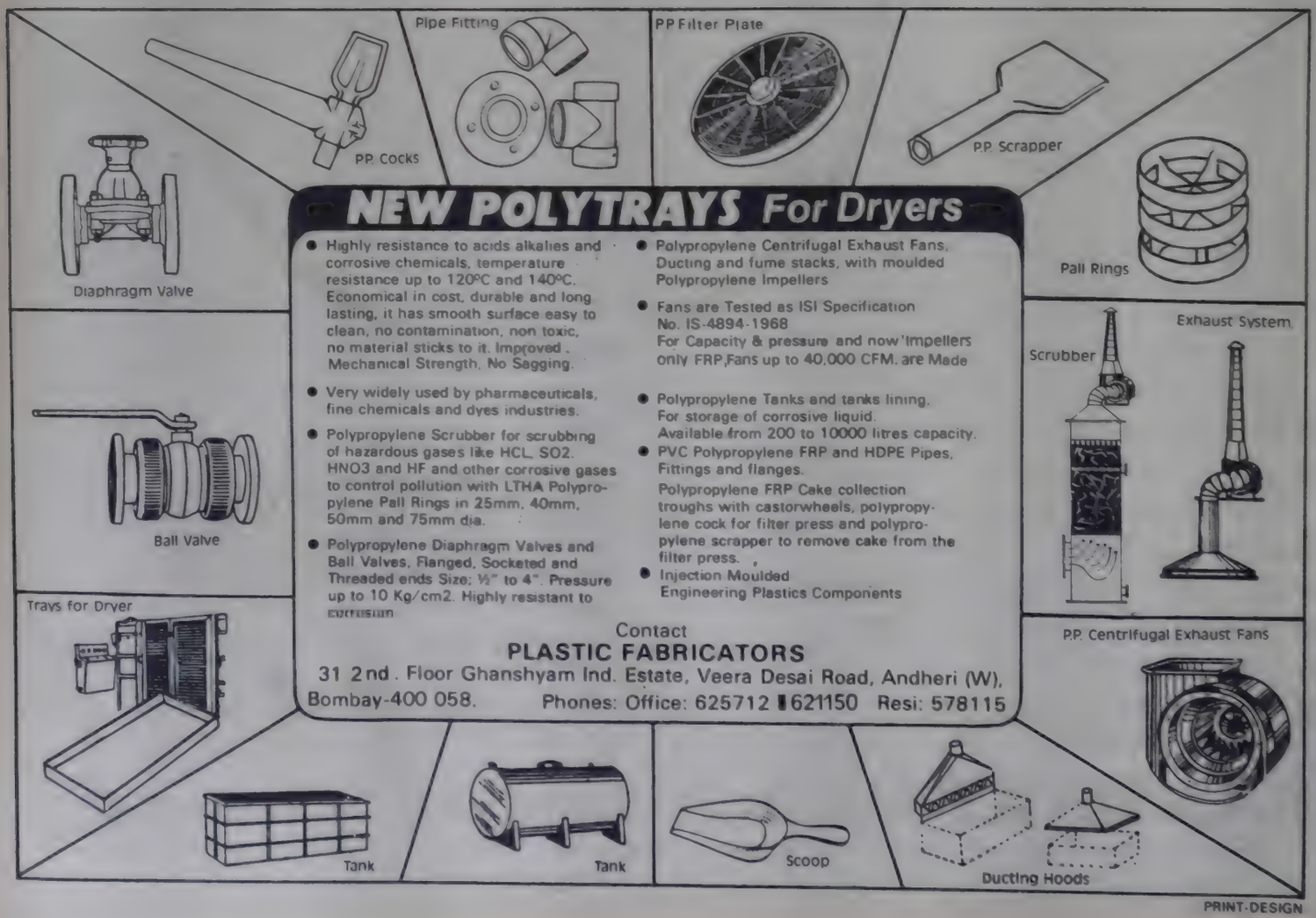

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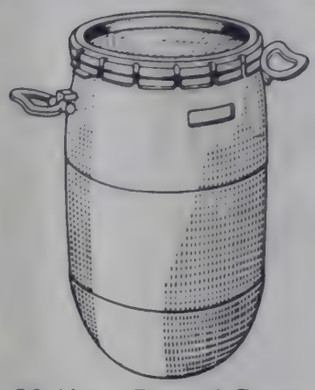
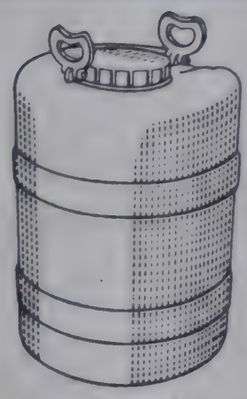
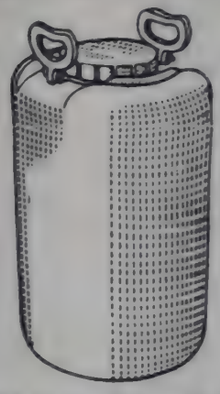
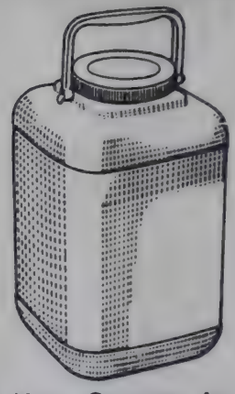

30 Kgs. Round Drum
Full Top Open – 10" Cap


50 Kgs. Round Drum
– 6" Cap

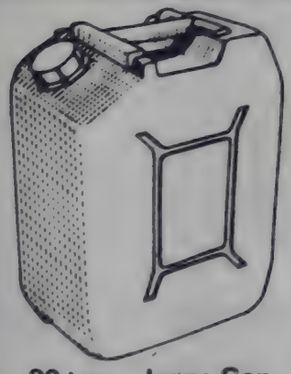

30 Kgs. Round Jar
– 6" Cap

20 Kgs. Round Jar
– 6" Cap


6 Kgs. Square Jar
– 4" Cap

5 Ltrs.
Jerry Can

6 Ltrs.
Jerry Can


30 Ltrs. Jerry Can
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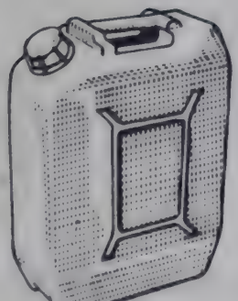
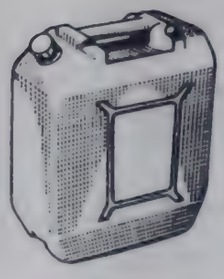

20 Ltrs. Jerry Can
Stackable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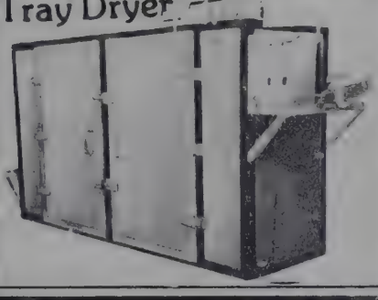

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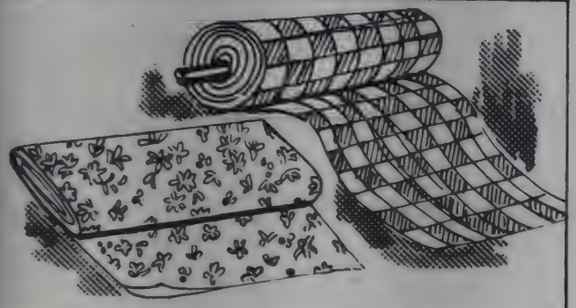

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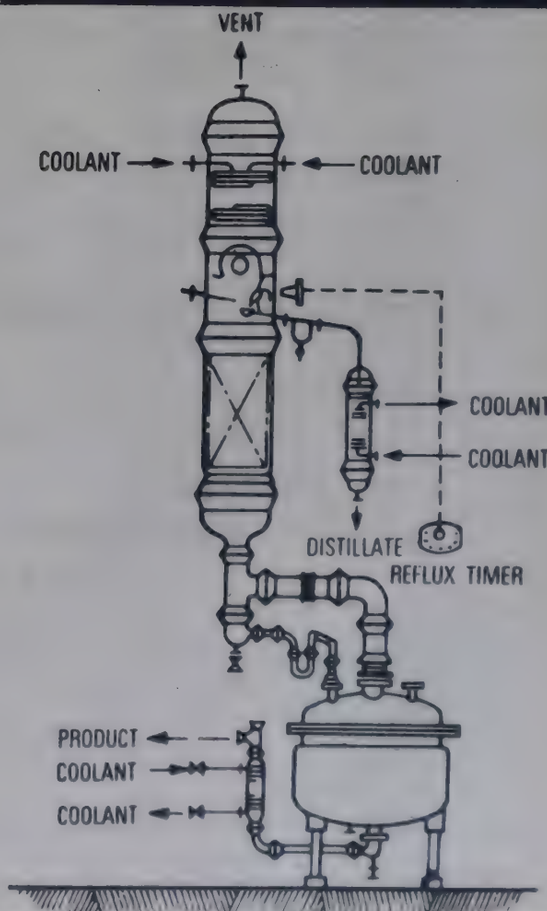

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Material Science in Transition

Material Science and Engineering as a field of enquiry, has undergone a fundamental and dramatic change over the past two decades.

The second half of this century saw the emergence of the science of solid state as a field of major importance. The simultaneous developments in the more current fields of synthetic polymers, rubbers, plastics and modified bio-organic substances have contributed significantly to the growth of material science.

Contributions to material science from the collateral fields of physics and chemistry have provided an expanded base of knowledge and a greatly extended ability to study the structure of both crystalline and amorphous cells. The extended use of particle accelerators, high resolution electron microscope and microbrome analysers, intense-pulsed neutron sources, surface analytical instruments and optical probes to characterise the electronic, atomic and molecular properties of condensed matter states have opened up new pathways for material synthesis.

The fields of material science and engineering are burgeoning, so much so, it is difficult to distinguish between future developments and near term applications.

The last two decades have provided many notable advances in near net shape fabrications methods advances, that greatly reduce or in some cases eliminate the need for final machining or grinding operations. For example turbine blades are now being produced by single crystal castings, and complex shapes are being commercially produced by one step superplastic forging of powdered-metal billets.

In just over a decade, the optical attentuation of silicon fibers has been reduced by over five orders of magnitude at selected wavelengths.

Developments in optical materials and concurrent advances in semi-conductors and electronically active polymers have brought about new developments in advanced sensors, control systems, inspection systems, medical diagnostics, microsurgery techniques and communication.

The availability of advanced ceramic metallic compacts, intermetallic compounds and ceramic coatings has been a key enabling factor in the stepped up activity in the field of cutting tool materials with higher tool speeds and material removal rates.

Trends in polymers are at the fore-front of future technologies. Commercial developments over the past two decades include polyamide fibres with strength and modulus properties superior to those of many materials commercially available today; temperature resistant aromatic polymers that will displace many strategic materials for elevated temperature applications, electronically active polymers with electronic metals, improved thermoplastic resins, suitable for stamping out high production rate, fiber reinforced composit parts etc.

For transportation systems, the quest for new materials for higher strength and stiffness relative to density has led to the increasing use of composit materials consisting of reinforced plastics; these composites are increasingly used for helicopter rotors and propellers.

Over the next twenty years, the demands, use patterns and sources of supply of materials can be expected to change drastically. The demand for silicon for semi-conductors will continue to increase over the next ten years but the demand for compound semiconductors will accelerate even more.

Dramatic improvements have been made in the past decade in specific fuel consumption of commercial and military jet engines. For example turbine blade cooling flow has decreased approximately 4.3% to 3.2% of core flow and turbine inlet temperature have increased by about 150°F. These improvements have been principally achieved by the introduction of directionally solidified super alloy turbine blades, intricate ceramic casting core to define internal cooling passages and improved alumina coatings to provide oxidation and hot corrosion resistance.

The development of single crystal blade materials, that promise temperature improvements of 75-100°F over directionally solidified materials represent one such radical change. The first commercial engine using single crystal blades is already in use in wide body commercial aircrafts and will soon see service in advanced strategic intercontinental cruise missiles and medium range air to surface missiles.

Many of the materials and processing developments being pursued for advanced military, and commercial jet engines are also of interest for rocket engine turbo machines. Because of the high premium tied to weight reduction in such space propulsion systems, the application of alloys such as titanium aluminide, which exhibits high specific modulus, high specific creep strength, and good oxidation resistance at elevated temperatures, looks specially attractive.

By 1990, advanced structural ceramics such as silicon carbide, silicon nitride, silicon aluminium oxynitride, stabilised zirconia, and toughened multicomponent, multiphase ceramics will find increasing use for heat engine applications, gun barrel liners and wear and impact parts such as bearings. Vehicles having ceramics for pistons, cylinder heads, valves, cylinder lines, exhaust valves and parts have been demonstrated.

Developments for 150-200HP power plants for main battle tanks are also under way. The next generation of rotary aircraft, now in advanced development will have primary structures -- roof, fuselage, rotors and aft rotor shaft, constructed almost entirely of advanced epoxy composits reinforced with various combinations of graphite glass fibers. The compound strength will provide weight saving of over 1000 lbs. per aircraft, greater tolerance to ballistic damage, lower radar cross section and better crash worthiness.

During 1990s, carbon-carbon and metal matrix composits will displace epoxy composits, superalloys, beryllum alloys and more conventional alloys for special applications.

The automotive industry is already witnessing a materials revolution with the increased use of high strength steels, fibre-reinforced composites, structural polymers and high technology ceramics to meet fuel economy goals. The average vehicle will weight under 3000 lbs. still comprising some 50% steel and 130 lbs. alumina. 350-400 lbs. of new grades of high-strength steels and some 250 lbs. of plastics per car will be used. As compared to the late seventies the use of grey cast iron will be decreased by 50%.

Japanese automakers are already introducing high technology ceramics in automotive heat engines in the form of push rods, glow plugs, turbocharger rotors, Swirl Chambers, tappets and seals. They plan to introduce new ceramic components annually throughout the remainder of eighties and nineties until they finally achieve a fully integrated turbo compound diesel engine well before the year 2000.

In addition to the race for the adiabatic engine, automakers and engine manufacturers in the United States, Japan and Europe are actually exploring the uses of high technology ceramics parts for automotive turbine engines, regenerators, engines etc.

The future is also bright for the use of polymer materials in transportation system. For example bumper systems employing reaction-injection moulded urethane for frame are already familiar and new bumper systems employing injection moulded blends of polycarbonates and polyester to form a "a toughened" polymer alloy are currently being introduced in the US and Europe.

A new imaginative automatic application of polymers is the development of a moulded plastic engine by Polimotor Research Station. Such an engine, based on Ford four cylinder design contains 40 lbs. of fiber reinforcement, 60 lbs. of resins, 68 lbs. of metal for a total weight of 168 lbs. Polimota will also produce light weight power plants (which can safely operate at 14000 raw/minute and develop 318 HP) for racing cars.

Fibre reinforced composits have been experimentally evaluated for many uses in the automotive industry. Glass-reinforced composites are already widely used in automobile bodies. Several potential applications have been identified for graphite fibre reinforced resin composits, to include leaf-springs, steering components and drive line components. Thermoplastic resins -- polyamic-polycarbonate and thermoplastic polyester are more amenable high production rate but generally have low strength and low maximum service temperatures. Specialty resins; polyester ether ketone and polyetherimide contain stiff polymer chains and as a result have higher strength and higher maximum service temperature upto 200°C. However they are generally more costly and more difficult to process.

The use of graphite reinforced and Du Pont Kevlar reinforced epoxy composites in the fuselage wing structure, seats and other structures in commercial aircraft will increase in the coming decades.

Higher strength to density aluminium alloy sheet and extruded forms produced from rapidly solidified powders will also contribute to weight savings. The introduction of metal mature composits and intermetallic alloys (titanium aluminides) for compressor blades, directionally solidified and single crystal nickel-base super alloys for turbine blades, of silicon-slicon carbide and carbon-carbon composites and covalent compound ceramics for combuster components will result in greater weight saving, specific thrust and conservation of strategic material for defence.

-- T.P.S. RAJA

CHEMARENA

S.L. VENKITESWARAN

India's Natural Rubber Outlook

India's attempts to step up the production of natural or synthetic rubber have been in poor shape. The replanting with high yield rubber seeds has not made much headway and there is hardly any new large rubber areas outside of Kerala. The problems and difficulties of the small plot holders are increasing all the time and the price fixation schemes are always subject to controversies. Recently India has taken the assistance of Dr. B.C. Sekhar of Malaysia, an international expert in natural rubber. He was entrusted with making an unbiased objective assessment of the Indian Rubber Scene up to 2000AD. The report provides three scenarios as is the practice nowadays -- optimistic, achievable and conservative -- and in relation to similar demand projections. Earlier the NCAER had evaluated the production-demand picture upto 1989-90 and have apparently overestimated the demand and underestimated indigenous availability -- much to the liking of the rubber processing sector.

Apart from the estimates of output, the more important issue with political implications is of the cost of production and fair prices to the producer. Dr. Sekhar works out a production cost of Rs. 10 per kg. in the smaller estimates but exclusive of the costs of land and capital costs -- which are all-important for the mini estates.

Dr. Sekhar is familiar with Malaysian conditions of large estates. The fair price as per Indian sources works out to between Rs. 16.50 to 17.50 per kg. but has risen again in the last one year. Another matter of controversy is on buffer stock holding and the responsibility for the same. The consumers want to keep their stocks at lowest possible levels to reduce interest charges. Dr. Sekhar suggests the concept of a "consignment stock" and transferring part of the cost of holding away from the producers and on to the Government or users. Dr. Sekhar also sees the need for increasing the supplies of synthetic rubber and at lower costs. The usual argument of high levels of synthetic rubber usage in other countries has no relevance to India with its production of over 2,00,000 tonnes of natural rubber, but so long as there are large deficits it is advantageous to import synthetics.

India's programmes for synthetic rubber have also remained static for a decade. Programmes of expansion by Synthetics & Chemicals have remained on paper with their inclination to move away from ethyl alcohol.

Meanwhile the latest international data on rubber as per International Institute of Synthetic Rubber Producers is given in Table.

MODEST INCREASES FORECAST FOR RUBBER CONSUMPTION
(Thousands of metric tonnes)

	US & Canada		Western Europe		Latin America		Asia & Oceania		Africa & Middle East		Total	
	1987	1992	1987	1992	1987	1992	1987	1992	1987	1992	1987	1992
Styrene-butadiene[a]	839	833	727	745	329	386	674	783	63	72	2,632	2,819
Carboxylated styrene-butadiene	447	458	335	370	21	29	125	152	5	6	933	1,015
Polybutadiene	422	424	240	257	109	131	270	309	19	21	1,060	1,142
Ethylene-propylene diene	204	216	170	195	11	16	107	126	2	3	494	556
Polychloroprene	86	85	81	77	19	23	68	78	5	5	259	268
Nitrile	68	66	81	85	13	17	51	66	3	4	216	238
Other synthetics[b]	457	479	216	244	39	46	197	223	22	33	931	1,025
TOTAL SYNTHETIC	**2523**	**2561**	**1850**	**1973**	**541**	**648**	**1492**	**1737**	**119**	**144**	**6,525**	**7,063**
Natural	872	871	945	980	247	296	1568	1804	140	180	3,771	4,131
TOTAL RUBBER	**3395**	**3432**	**2460**	**2953**	**788**	**944**	**3060**	**3541**	**259**	**324**	**10,296**	**11,194**

Note: Excludes communist countries (a) Solid and latex forms of SBR (b) Includes polyisoprene and butyl **Source**: International Institute of Synthetic Rubber Producers

New Super Conductive Material

A totally new material superconductive at 30°K announced by AT & T Bell Laboratories has no copper in it. It is based on Barium-Potassium-Bismuth Oxides. So far the theory of superconductivity has been based on the key structure of copper oxides as the basic feature. A series of single-phase Ba-K-Bi-O materials have been made and the one with transition temperature (to superconductivity) at 29.8°K was of composition $Ba_{0.6}K_{0.4}Bi\ O_3$ -- a potassium substituted version of the parent compound Ba-Bi-O_3. We have already seen superconductive materials without rare earth elements but based on copper and even the copper now is out. In fact a bismuth compound $Ba\ Pb_{0.75}\ Bi_{0.25}\ O_3$ was reported as superconductive at 13K as early as 1975.

The new compounds are said to be "classic perovskites" in crystal structure with a truly three dimensional arrangement of bismuth and oxygen atoms while all the copper oxide materials are two-dimensional layered structures. The layered materials carry current along the copper oxygen planes and not in all directions. The materials -- oxides of the constituent metal -- are ground together and heated up to 675°C for **three days inside a silver tube** and later annealed in flowing oxygen at 475°C for 45 minutes, quickly cooled and pressed into pellets. Much more will be heard of this new class of superconductors in the near future. But the thallium based materials of transition temperature about 125°K may be the winner among the candidates so far even if the methods of processing into workable forms of high current capacity will be critical. Meanwhile many more variations of the complex ingredients and heating up schedule are likely -- all on empirical basis with no theory to predict the behaviour of resultant compounds. Earlier compouds have been Lanthanam -- Copper oxides of T_s 40°K, Yttrium Barium Copper oxides of T_s 93°K and the thallium, strontium, bismuth copper oxides of T_s 120°K -- $Bi_2\ Sr_{3-x}\ Ca_x\ Cu_2\ O_{8-y}$ where x could be 0.4 to 0.9 and Y 0.2. This bismuth material of T_s 120°K is easier to make while the latest copper free materia needs troublesome operations even to reach the T 30°K.

HDPE against Jute Bags

Of late there has been a lot of comment on the distress of the 500 units engaged in making woven bags for packaging from HDPE. This sector has made an investment of nearly Rs. 500 crores in the space of 3 years, most of it in bank loans with several of them going public and with good response. The latest indication is that about 300 have already shut down and operation in any case has rarely exceeded 25% of capacity. An analysis of the leading units show a big fall in the share prices with no dividend for the share holders.

The state of affairs is attributed to the sudden craze to enter into the market in the wake of the successful initial batch of units and look for a fast buck. Neither the entrepreneurs nor the Government authorities granting approvals have take care for ensuring progressive developments in line with market potential and foreign exchange for imported HDPE to meet the ever widening gaps between production and demand. It was also a lack of coordination of the market for woven HDPE bags with the totally indigenous agro based jute bag used traditionally. The banks also seem to have bee over-enthusiastic in this march to modernisation with out looking at the repercussions on the market for jut When the Government woke up to the building up cris they have clamped restrictions on the use of HDP sacks by the two major consuming industries of fertili ers and cement through a Jute Packaging Mandato Order.

This order was fought out in courts and though a st was obtained in the High Court, the validity has bee sustained in the Supreme Court. So the HDPE wov sacks producers are left with no alternate but to live w the restricted use for fertilisers and cement packing u the packing sector develops to absorb the surpl capacity. The situation in HDPE woven sacks sect reflects poorly on some of the Government agencies act in haste to throttle at leisure -- the sufferer being t industry not the Government.

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OGL import of 2 pesticides being reviewed

The Union Government has veered round to the view that the import liberalisation measures introduced in respect of at least two pesticides would have to be modified suitably to ensure that easier imports do not adversely affect the domestic industry.

The Bureau of Industrial Costs and Prices (BICP) has been asked to assess what the fair selling price in the domestic market should be for two varieties of pesticides. These are: monocrotophos and butachlor. BICP has been asked by the Department of Chemicals and Petrochemicals in the Industry Ministry to submit its finding within the next four weeks.

The reason for referring the fair selling price issue of these two pesticides to BICP is to find out whether the domestic manufacturers of these items are selling these at an exorbitantly high price or at a reasonable price. Official sources say the Government will take suitable steps in regard to modifying the import liberalisation measures for these two items on the basis of BICP's report.

For instance, if the BICP report suggest that the manufacturers are charging an exorbitant price from the domestic consumers, the Government will be asking the local producers to bring down the prices and remove the items from the list of items, which can be imported under open general licence (OGL).

On the other hand, if the report indicates that the domestic producers have been selling these pesticides at reasonable prices, the Government will be encouraged to remove them from the OGL without much delay.

But the fact that the Industry Ministry has referred the price issue of these two varieties of pesticides to BICP indicate that similar import liberalisation measures introduced for 13 other pesticides will continue to be in force. It was earlier understood from official sources that the Government was reviewing the decision to put 15 pesticides on OGL in view of the representations received from the domestic industry.

But a review of these measures in respect of each of these 15 pesticides has shown that easier imports would not affect the domestic producers of 13 of these pesticides. The two items which would be affected, according to the study, are those for which capacities were recently created.

The official argument is that pesticides, for which capacities have been freshly created, should not be exposed to easy import competition in the early stages of production. Moreover, both monocrotophos and butachlor are critical pesticides and creation of adequate domestic capacity in these areas is imperative if dependence on imports has to be avoided in the long run.

Fear of increasing imports was expressed soon after the Government brought down the import duty on these 15 pesticides substantially and also put them under OGL. The domestic pesticides industry pleaded with the Government that it could not withstand external competition if imports were made easier. The Government did not respond to the pleas for revoking the decision on import duty cuts on the grounds that the objective of the duty reduction was to make these critical pesticides available to the agricultural sector at reasonable prices, so that the targets of foodgrains production could be achieved.

But on the issue of allowing these pesticides to be imported under OGL, the Government agreed to review the position. Even here the review has shown that only two out of the 15 pesticides put under OGL need some modification in the import provision for them.

The domestic pesticides industry has made steady progress in the last three decades. As of now, more than 57 technical grade pesticides are manufactured in the country by about 47 units. In addition, over 500 units are engaged in manufacturing pesticides formulations.

GUJARAT INSECTICIDES' NEW PRODUCT

Gujarat Insecticides Limited (GIL), Ankleshwar has successfully started manufacturing technical grade monocrotophos an effective pesticide beneficial for all agricultural operations.

According to a company release in Bombay it may be recalled that GIL has got a headstart with its management being taken over by Gujarat Narmada Valley Fertilizers Company Limited (GNFC) and with professional management GIL is taking rapid strides in the development and production of a complete range of products.

The successful development and launching of monocrotophos (technical) is related directly with the establishing of GIL's own sophisticated R&D centre with pilot plant facility about a year back. Not only the technology for monocrotophos was developed at the R&D centre, but all tests conducted for the product have proved its quality and efficiency.

By starting production of monocrotophos (technical), GIL is in a position to offer five technical grade products viz. quinalphos, carbendazim, cypermethrin, fenvalerate and monocrotophos. GIL can also offer a few intermediates like Meta Phenoxy Benzaldehyde (MPB), Quinoxalinol, Isopropyl, Chloro Phenyl Acetic Acid (PCA) etc. for use by other technical manufacturers..

FURTHER DELICENSING OF INDUSTRY ANNOUNCED

In a major liberalisation move, the Union cabinet tonight decided to further dellcence industries in backward and non-backward areas.

Sources said under the new policy licences would not be required to set up industries with investment upto Rs. 50 crores in backward areas and upto Rs. 15 crores in non-backward areas.

Details of the new policy would be released shortly.

They said the decision would go a long way in efforts to spread industrial growth in backward areas and remove unemployment.

This is in line with government's policy of liberalisation through delicencing and broad-banding of industries for the quite sometime now.

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New port to handle polymers

Anticipating a serious shortfall in the availability of polymers, the Union government is seriously thinking of a separate port with modern facilities on the western coast to import polymers. The facilities available in Bombay and other ports are not adequate.

According to indications available, the gap between availability and demand for polymers may persist since there will be no new cracker for at least another four years after the Maharashtra gas cracker is commissioned in 1990-91.

The demand for polymers alone was expected to be 817,000 tonnes during 1989-90. Against this, the total availability primarily from IPCL and NOCIL/PIL is likely to be only 383,000 tonnes, leaving a gap of 434,000 tonnes. Additionally, it will be necessary to import acrylonitrile and mono-ethylene glycol in large quantities. Several other petrochemicals would also require to be imported.

As this position is now likely to continue in the foreseeable future due to the unfortunate gap created in the requirements & availability by tardy decision-making at the Centre, the department of chemicals and petrochemicals has already prepared blueprint which will enable the import of intermediates like vinyl chloride monomer (VCM) or ethyl dichloride (EDC) and ethyl benzene/styrene so that products like PVC and polystyrene can be manufactured without waiting for the new complexes to come up.

Another proposal under consideration is to import ethylene and propylene in large quantities till the new crackers are commissioned and manufacture polymers based on imported ethylene and propylene. By these measures, the Polymers will be available in the country by import of feedstocks or intermediates. This will encourage setting up downstream projects and thus reduce the import bill to some extent, official sources assert.

The reduction in the import bill would have been very much higher if the approvals for the Haldia and Hazira crackers had been given 2 years back. Similarly, the joint venture Mangalore cracker, announced with a lot of fanfare, has taken almost a year merely to get the approval for preparing the project report. The intermediate feedstock-based polymers, undoubtedly save some foreign exchange, but certainly at a very much increased domestic resource cost for setting up such downstream polymer units alone, without crackers. An integrated complex has a distinct economic advantage. That is why it is widely favoured.

Faced with the realities at home, however, all options were explored during the recent visit of the delegation led by the secretary (chemicals and petrochemicals to Saudi Arabia and the response, it is learnt, has been extremely positive. The main problem, however, is that there is no port in India which has facilities to handle ethylene or propylene. These require special jetties and terminal facilities. Import of ethylene and propylene will be necessary not only for new downstream projects but even for initial commissioning and expansion of the Maharashtra gas cracker. It was, therefore, recognised that facilities for handling ethylene and propylene should be set up on an urgent basis.

The department of chemicals and petrochemicals has, therefore, decided to prepare a proposal for a port to handle these raw materials. This port can have storage facilities for ethylene and propylene as well as other petrochemical raw materials and intermediates. From the port ethylene and propylene can even be sent by a pipeline to various consumption centres.

In the long run, the port may still be needed for the export of petrochemicals, instead of high-cost imports. The laying down of the port will require dredging, setting up jetties, storage and other handling facilities — in fact a regular port only for handling of petrochemicals. Such port facilities exist in Al Jubail in Saudi Arabia which was visited by the delegation. The ideal place for such a port, official sources assert, would be on the western coast. The department is studying various locations on the western coast for such port facilities.

According to experts, India's vital plans for restoring ecological balance, for energy conservation and for generating jobs could go awry unless the shortage of polymers and other petrochemicals could be quickly made good. With the petrochemicals-based polymers replacing timber, heavy weight steel with lighter and stronger car components, in increasing quantities, the government had ambitious plans to restore the ecological balance by preventing deforestation and cutting the consumption of petroleum fuel by substituting lighter plastic materials with heavier steel in automobiles.

Unfortunately, the current juncture happens to be the worst to try and buy polymers. Some of these are just not available at any price. As for the rest spot markets are very thin and the prices quoted are literally skyrocketing in some cases, to levels twice as high as 18 months back. There are no immediate prospects of the international situation improving. On the other hand, a massive explosion at the Shell plant at Louisiana in the U.S. and some other minor problems elsewhere have made the situation a seller's paradise. This could result in a foreign exchange outgo of some Rs. 800 crores in 1989-90.

DUJODWALA RESINS

Dujodwala Resins and Terpenes is setting up a Rs. 4-crore plant to manufacture camphor from pinine.

The process to make camphor is developed by the company's R&D centre with the help of National Chemical Laboratory, Pune, according to a press note released by the company.

The parent company, Dujodwala Resins & Terpenes, located at Jammu in J.K. State, manufactures various import substitutes i.e. resins and terpenes widely used in diverse fields of industry.

The factory is the largest excise provider in J.K. since major production is sold or despatched directly to the parties and the formalities like sales tax, excise, are made directly from the factory in J&K.

Dujodwala Resins has also entered into an agreement with one of the largest U.S. companies for production of paper size. The company's project has been cleared by the Union Government.

Referring to the allegation of excise and sales tax exasion in a section of the press, the press note says the report was misleading, motivated and incorrect. Every year, the company received certificate of appreciation from the audit of Central excise, the press note adds.

Research labs urged to commercialise know-how

There exists noticeable gap between he technologies developed in the re-earch laboratories and commercial ap-licability at the industrial level, said r. Sergio Trindade, Consultant to he World Bank on Industrial Techno-gy Development during a dialogue ith the members of the Indo Brazilian ociety on 3rd June at Bombay.

Dr. Trindade was heading delega-on of experts on a mission to India study the ways and means to sup-ort the development of industrial chnology in India.

Dr. Trindade's mission also includ-d the evaluation of the scope for he development of appropriate tech-ology, particularly in the fields of hemicals, petrochemicals, pharma-euticals, food processing and allied reas in the context of the researches one in the Indian laboratories.

He said that the World Bank under similar scheme had financed coun-ies like Korea, Spain and Mexico for eveloping their in-house technology. He added that the interaction etween the research laboratories and ndustries in India needed to be im-roved to enable the venture results be converted into a useable result n commercial way.

He also felt that there was also a eed to bring about the awareness in he research laboratories to make their roject results into viable ventures.

Dr. Trindade advised that the indus-ries should explore the possibility of aving an ongoing relationship bet-ween some specific laboratories and pecific industry associations and ins-tutions.

However, he felt that the possibi-ty of success of a technology was efinitely more if the recipient indus-y had its own in-house R & D facili-ies.

While answering a score of queries rom the participants, he observed, that n his opinion, agricultural revolution might not take a country very far. He emphasised tha only industrial devel-opment would help the dynamic grow-th and productivity of a country in the long run.

His mission would also cover the study of successful interaction between the linking of research done at the University level, and the industries as the role of the University in the deve-lopment of technology was consider-able.

Based on his observations and study of the situation, the World Bank would decide on the structure of these loans amounting to $ 100 to 200 for sup-porting in-house research and develop-ment of technology by the national la-boratories.

What the industry in our country needed was the development of a strong in-house technology base for in-creasing the productivity and growth of the Indian industries, said Dr. Anil Kadakia, President, Indo-Brazilian So-ciety while welcoming Dr. Trindade and the participants.

Dr. Kadakia said that the technolo-gy upgradation in some of the indus-trial sectors in our country was long overdue. As an example, he cited the plight of the alcohol and alcohol-bas-ed industry and its growth being seri-ously hampered by the impractical norms set by the Government and an inherent use of redundant technology.

The incentive and the scope for the development of newer production tech-nology in this country was not easily forthcoming in the context of size of the distilleries and the quality of the molasses.

Dr. Anil Kadakia said that our pre-sent chemical and petro-chemical in-dustry were not just satisfied with us-ing the imported technology but were striving to improve the knowhow in-digeneously.

Mr. Rustom Tirendaz, Hon. Secre-tary of the society, proposed a vote of thanks.

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U. S. company to quit CRL

The Phillips Petroleum Company of U.S. joint promoters of Cochin Refineries Ltd. (CRL), along with the government of India, has decided to quit.

Its share of 18.49 per cent of equity holding is proposed to be disposed of in the open market within the next couple of weeks.

Phillips Petroleum has already lost controlling right on the board of directors following its decision not to participate in broadening the equity base of the company. To begin with, this company's shareholding was 26 per cent.

After the exit of the US company, the board of directors will include only official nominees. This was disclosed to a visiting press party from New Delhi, by the chairman and managing director of Cochin refinery, Mr. J. Jayaraman.

CRL, established in the 60s, as one in a chain of refineries around the country to meet the objective of achieving self-sufficiency in refining capacity, has already expanded its capacity from 2.5 million tonnes to 4.5 million tonnes. It has now submitted a proposal to the Union government for expanding the capacity further to six million tonnes at a cost of about Rs. 100 crores.

Having achieved "remarkable success" in refining, Mr. Jayaraman said a corporate plan for the period 1986-90 and perspective plan till 1995 setting out the long term goals and strategies had been drawn up.

To avoid stagnation, new thrust areas have been identified and concrete proposals have already been submitted to the Union government for its approval.

The proposals include setting up of a plant for production of linear alkyl benzene (LAB) with an annual capacity of 60,000 tonnes at an estimated cost of Rs. 200 crores. Linear alkyl benzene is the main raw material for production of synthetic detergents. It forms surfactants in the detergent formulation. It is also consumed in textile and paper industry.

CRL's proposal for production of LAB is based on gaps identified in the supply demand balance in the coming years and refinery's strengths to install and operate such a plant. It is estimated that an additional capacity of 216,000 tonnes per annum is required by 1995.

The raw materials for production of LAB are normal paraffins extracted from kerosene and benzene. This project required 49,100 tonnes of normal paraffins and 20,400 tonnes of benzene annually.

The estimated production of superior kerosene at CRL from 1990-91 onwards is about 864,000 tonnes per annum based on a projected crude mix consisting of 3.5 million tonnes of Bombay High and 1.0 million tonnes of imported crude, whereas the demand for kerosene in Cochin supply area around 1990-91 is about 600,000 tonnes annually.

Therefore, sufficient quantity of kerosene can be made available for production of normal paraffins after meeting the demand of kerosene.

The benzene project of CRL, with an annual capacity of 87,200 tonnes, currently under implementation, is expected to go on stream in February 1989. The benzene requirement for the LAB can be met from this project.

Since both the raw materials (benzene and kerosene) are produced at the refinery itself, advantage can also be derived for operational flexibility of the production unit.

Availability of land and utilities like power, water also favours installation of the LAB production facilities at the refinery. CRL has initiated action to procure additional land for future projects including LAB. A captive power plant is also proposed at the site.

(Contd. on Col. 3, p. 44)

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(An author of repute and a visiting professor, Dr. Kharbanda consults worldwide including to UNIDO)

The Secret of IBM's Success

A former IBM'er, David Mercer has given us an insider's view of the secret of the success of 'snow-white' (as IBM is named in relation to the 'seven dwarfs' representing its competitors) in a recent book (IBM: How the world's most successful corporation is managed, 314pp, Kogan Page). Mercer has been involved with various aspects of IBM's business including marketing, sales and administration during the period 1971-1985.

IBM is not only by far the largest in the computer field, it is also one of the most powerful and most successful companies in the world. Its success is rightly ascribed to IBM's management style which has come to be considered as a 'model' for others, not only in terms of practice but theory as well. In fact even the Japanese 'miracle' owes much to this 'model'. Relevant historical background is also included.

After a 20 page introduction (with the subtitle: a unique case?), three chapters are devoted to the history to the of IBM titled The fathers, The sons and The bureaucrats. Section 2 (The Modern IBM: the 'Model') which occupies the bulk (140 pages) of the book comprises of eight chapters titled, Independent business units, The personal computer, Organization by controlled anarchy, Countries and their divisions, Sales supermen?, Party time, End-user marketing and Personnel and corporate affairs. The last section (The Lessons to be learnt) has just one chapter titled The Japanese Lesson. Three appendices deal with: The sources of IBM's financial strengths, what should a customer expect? and political lessons. There is a half-page bibliography listing books that are most directly relevant and an adequate index. A well balanced book with constant emphasis on the key lessons. IBM's management theory and philosophy seems a logical extension of Theory X & Theory Y (Douglas McGregor: The Human Side of Enterprise, McGraw-Hill, 1960) as also Theory Z (W. G. Ouchi, Addison Wesley, 1981). It has two well-balanced components:

* The trust between management and employees leading to flexible working practices and worker motivation, in effect Theory Z. Its ten major ingredients are: strong beliefs, lifetime employment, job enrichment, personal incentives, broad career development, decision by concensus, implicit control, strong culture and holistic approach to employees.
* Effective control at individual's level — in line with the IBM's founders complete faith in the MAN. The ten major components of this philosophy are: respect for the individual, personnel processes, single status, recruitment on merit, extended training, maximal delegation, planned constraints, encouraging dissent and horizontal communications and change institutionalisation.

IBM is noted for completely remodelling itself as also its product lines every five to seven years and yet it has constantly maintained product leadership. This is contrary to the normal recipe for success and a real enigma to its competitors. Further, IBM is unique in defying Peter Drucker's assertion that product leadership is usually transitory and short-lived. Even the most successful Japanese companies have not been able to maintain their leadership position for more than two decades. But, in case of the quality circle concept, originally IBM's but taken to heart by the Japanese, IBM has had to relearn this lesson from Japan ! And without any hesitation, too.

IBM model is most relevant to the Indian context. IBM's unique philosophy and culture has helped its 400,000 INDIVIDUALS work TOGETHER in pursuit of excellence. If only we could do so . . . .

Bizarre world of petrochem prices

Ever heard of a raw material being priced higher than the finished product? The latest c.i.f. price of paraxylene in the international market is $680 per tonne and the end product, DMT (di-methyl-terephthalate), is quoted at $650 a tonne.

"This is something that has never happened before," exclaimed the director of a well-known firm. "Even at such prices, the material is seldom available."

The polyester industry, whose problems are often magnified by corporate cold wars, is in for a real drubbing this time. The price of MEG (monoethylene glycol), an insubstitutable raw material, has touched the dizzy height of $1,250 per tonne. The price was only $350 last September. No wonder the Association of Synthetic Fibre Industry has appealed to the Government to slash import duty from 90 to 45 per cent.

An official of a Japanese trading company with long experience in MEG imports said the only people to be spared will be those who have entered into long-term contracts with overseas suppliers. But there are very few. He does not blame the Indian companies, though.

Indians' forte he said, is spot buying. "If someone offers goods $10 cheaper, they would order from him". A $10 difference on bulk purchases works out to a very big amount when you take into account the high import duties, he explained.

The Indian industry requires around 96,000 tonnes of MEG every year. Much of the imports are from Sabic of Saudi Arabia whose plant has been shut down following an explosion during Ramzan. Other closed plants include Shell in United States and DSM in Europe.

The result has been a squeeze on ethylene whose prices are no longer related to feedstock prices, but determined by demand and supply situation. The situation has become so bizarre that some suppliers do not honour contracts. There is an instance of 40,000 tonnes of a polymer destined for an Indian party being diverted to another country in the high seas.

The short supply is not likely to end in the near future. Japan is reactivating some uneconomic units following lifting of a MITI (Ministry of Trade and Industry) ban. There is no grass-root cracker coming up, except in China and, of course, in Nagothane in Maharashtra. There will be no dramatic increase in ethylene supplies for quite sometime, according to sources in Bombay.

(Contd. from page 42)

The refinery has implemented some major projects for expansion of the refining capacity and secondary processing facilities. The project for production of benzene is under implementation. Sufficient expertise is available with the refinery for its processes. Therefore, availability of skills for operation of the new facility is ensured.

The existing facilities for transportation of products by road, rail and water can be extended with marginal expenses for transportation of LAB.

Mr Jayaraman who personally conducted newsmen to the various sections of this spick and span refinery said special attention was being paid to safety and pollution control measures. Various schemes are being implemented in three phases at an overall cost of Rs 10 crores.

Mr Jayaraman explained that CRL is the first of the major industrial undertakings in Kerala to achieve the state government's consent to discharge water effluent to the backwaters. In addition to elaborate water treatment facilities, which enable the effluent water meet all standards laid down by the Kerala state pollution control board as well as international standards, the company has also adopted additional measures to take atmospheric pollution.

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Price control on more drugs may be removed

The government may decontrol some drugs such as rifampicin, diazepam and paracetamol which are currently price-controlled in the new Drug Price Control Order (DPCO), it is learnt.

Rifampicin, an advanced drug for the treatment of TB and leprosy, is classified in the category 1 of the new DPCO with a lower maximum allowable post manufacturing expenses (MAPE) of 75 per cent. The drug was listed in category III of the 1979 DPCO with a 100 per cent mark-up.

Diazepam, a tranquiliser, was decontrolled in the 1979 DPCO, but brought under control in the new DPCO. It is now listed in category II of the new DPCO.

Similarly paracetamol, an analgesic which was listed in category III of the old DPCO is now brought into category I of the new DPCO reducing its MAPE to 75 per cent.

According to informed sources, the government's move to decontrol rifampicin is in the context of strong representation made to the Kelkar Committee by the drug units on listing it in category I.

Although the drug is required in large quantities for the government's anti-TB and antileprosy programmes, the manufacture of this drug has not commenced in the country as yet.

The government appears to have been convinced by the argument of the drug units that for encouraging basic production of rifampicin in the country, there should be sufficient incentives for the drug companies. The basic manufacture of this drug calls for huge capital investments.

India requires over 80 tonnes of rifampicin anually and the cost of import is estimated at about Rs. 20 crores. The country does not import any other bulk drug in such large quantities and at such high cost.

In the case of diazepam also, there have been representations against bringing the drug under price control as it is only a tranquiliser. It is being argued that the drug should be kept outside DPCO as it would help drug units to make up their losses incurred on manufacturing the price-controlled drugs.

Paracetamol was not considered a life saving or essential drug in the 1978 drug policy as it is basically an analgesic. In the new DPCO, it is however listed in category I as an anti-malarial drug.

Although the drug is used in the treatment of malaria as the disease is always accompanied by high fever, it is not considered an anti-malarial drug, the sources point out.

The Kelkar Committee, set up for categorisation of drugs under the new DPCO, has received representations from 25 drug units pertaining to classification of 33 drugs listed in both the controlled categories.

The government has listed 26 essential drugs in category I and 139 drugs in category II for price control in the new DPCO.

KELWAR PANEL REPORT ON DRUGS CATEGORISATION BY JULY

The Kelkar Committee for reviewing categorisation of drugs in the new Drug Price Control Orders (DPCO) is expected to submit its report to the government only in the first week of July and not as expected earlier, it is learnt.

The Committee which had played an important role in the preparation of the new DPCO in August, 1987, was to submit its report in six months in February 1988. The government had subsequently given an extension of time upto May 15 and further to May 30.

It appears that the members of the committee are unable to finalise their views yet on the representations made by the drug companies seeking shifting of certain drugs from the controlled categories.

The government has listed 27 essential drugs in category I and 139 drugs in category II for price control in the new DPCO. The committee has received representations from 25 drug units pertaining to classification of 23 drugs listed in both categories. Representations from 26 MPs were also received by Committee with special reference to drugs like diazapam, menthol, paracetamol and vitamins.

According to informed sources in Bombay certain drugs like rifampicin, paracetamol, diazepam, etc. may be shifted from their preesnt category to either to category II or to the decontrolled category. Some of these were not considered as essential in the last DPCO and were thus given a higher mark up. In the case of drugs like rifampicin, an advanced T.B. drug the government had given a mark up of 100 per cent in the last DPCO mainly because to encourage the domestic production of the drug.

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Chemists threaten boycott

The All-India Organisation of Chemists and Druggists (AIOCD) seems to be all set for a showdown in its battle with the Government and drug companies on the trade margin issue.

The organisation's plan of boycotting drugs of those companies "which are not paying adequate margins" has started taking shape in West Bengal, where. The Bengal Chemists and Druggists Association has told its members to refrain from dealing in Glindia's products.

Though AIOCD denies having given a mandate for such a move, its President, Mr. Sohan Nayyar, maintains that "We have no option but to defend ourselves with all our might. Boycott is our ultimate weapon. Our efforts for negotiations with the Government and the industry have failed. The Government says it will consider but does nothing and the industry keeps doing us on higher trade on margins issue".

AIOCD will decide its final course of action at a meeting in Calcutta on June 25. Mr. Nayyar is afraid "that the boycott move might spread to other States too".

The Bengal organisation maintains that Glindia, despite having the "largest turnover", has been paying the lowest margins. "We will hence begin with Glindia", the organisation has told its members in a circular, implying that more companies will also face the boycott.

Similarly, in Rajasthan, The Fine Chemical Stockists Association has issued orders to its members to desist from appointing any new stockists of certain manufacturers.

The association had thretened, that if a manufacturer appoints a stockist without consulting the association, all stockists in the State will boycott his product and relinquish the stockistship. The boycott will then be intimated to all the departments, institutions in Rajasthan and the stockists outside the State shall be forbidden from making any supply of the company's brand.

The reason for this move cited by the association is that there is already more than enough stockists to meet that market demand.

However, the Director-General of Investigations and Registration in the Department of Company Affairs feels that "behind this mildly worded restriction, there is the clear threat of a boycott by all the stockists in Rajasthan of the concerned manufacturer". The Monopolies and Restrictive Trade Practices Commission (MRTPC) on the Director-General's plea, issued an ex parte ad-interim injunction restraining the association from indulging in such a move.

The companies which were to appoint stockists in Rajasthan were BDH-Merk, E-Merk, Glindia, Sarabhai and Ranbaxy. The association had decided to prevent some of the companies from doing so.

However, undeterred by the Commission's strictures, Mr. Nayyar says that there are "other ways" of boycotting the products.

"We are forced to go in for economic sanctions. The fate of our members is in peril. Till now we were living on false promises made by the Secretary of Chemicals and Petrochemicals who finally betrayed us by issuing drug price control order 1988 affecting the bread of the two lakh chemists by reducing their trade margins".

He said before 1970 the margin for retailer was 25 per cent, wholesellers' 10 to 15 per cent which was reduced to 10-12 per cent for the former and eight per cent in the case of the latter under the DPCO of 1970.

In the 1988 DPCO, the trade margin has been reduced by 2.5 per cent for retailers and 1.5 per cent for wholesalers.

"This is because of influence of powerful lobby of the industry on the Government", Mr. Nayyar charges and adds that AIOCD will move the Supreme Court for stalling "anti-consumer, anti trade" DPCO orders of 1987 and 1988.

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Romania seeks long - term import

Romania wants to import from India a number of chemicals, drugs and pharmaceuticals, valued at Rs six crores annually, on a long-term basis. The State Trading Corporation (STC) has been asked to give firm offers along with samples on a priority basis so that deals could be concluded expeditiously.

Apart from sodium hydrosulphite. potassium permanganate and magnesoium silicate (TALE), Romania has even mentioned the quantity which it would like to import from India in most cases.

Romania plans to import the following items: penicillin anhydrous BP 02 — 1000 kg., ranitinine BP/u — 1500 kg., Rifampicin USP 21 — 500 kg., theophiline BP 80—2000 kg., Tinidazole BP — 400 kg., Boric acid — 1000 tonnes, oxalic acid 200 tonnes and calcium carbonate — 100 tonnes (per month). Barring this item, the quantities mentioned against other products are on an annual basis.

These details were given by the Romanian firms to an Indian delegation which left for Bucharest on May 25. The team was headed by commerce and finance minister Narayan Datt Tiwari. The fourm for discussion was the joint commission meeting which concluded on May 28. A number of postiive results emerged from the session which would go a long way in promoting trade and expanding cooperation between the two countries, official sources hope.

Romania, on its part, has offered to supply to India certain polymers which are in short supply in the international market. India is importing these polymers from hard currency areas at present, resulting in outflow of foreign exchange.

A Romanian firm has agreed to supply 500 tonnes of high density polythylene (HDPE) in November-December, 1988, and thereafter 2,000 tonnes annually from 1989 to 1991. As far as PVC is concerned, it has offered to supply 1,500 tonnes in November-December, 1988, and 4,000 tonnes annually from 1989 to 1991.

Another Romanian company has concluded deals with STC for the supply of 10,000 to 15,000 tonnes of newsprint annually from 1988-89 to 1991-92.

Against the existing contract for 7,500 tonnes, the Romanian firm has already supplied 2,500 tonnes. Another shipment of 2,500 tonnes is on the high seas. The last instalment of 2,500 tonnes is expected to arrive in September-October, 1988.

Moreover, it has offered to supply cement, valued at Rs. 10 crores, for third-country trading for which an Indian delegation would visit Romania in August-September next.

There were discussions on joint ventures as well. A project for setting up a footwear unit in India has been envisaged under the protocol signed by the two countries. Romania will supply the know-how. It is proposed to export one million pairs of footwear from this unit to third countries.

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Good outlook visualised for aspirin Units

The new drug policy is expected to benefit producers of aspirin (salicylic acid). Under the new drug policy of 1987, aspirin formulations have been entitled to a 100 per cent mark-up against a 40 per cent mark-up allowed so far. Aspirin manufacturers will be allowed to take up the formulations up to five times of the bulk manufacturing capacity. New applications have been found for aspirin all over the world, particularly in the treatment of heart disease.

The demand for aspirin has increased significantly in the U.S.A. Thus, there is good potential for exporting aspirin from India to the U.S.A. and western Europe. By bringing the bulk drug under the modvat scheme through the Finance Bill 1988, the Government has extended sizable benefits to this industry. The industry has been granted a price revision whereby the price for the bulk drug has been increased from Rs. 62 per kg. to Rs. 80 per kg. with a 5 per cent excise levy.

Owing to the non-availability of the main raw material, phenol, some aspirin manufacturers had to suffer in 1987. The phenol plant of Hindustan Organic Chemicals at Cochin was to have been commissioned in early 1987 but the plant was commissioned only at the beginning of 1988. Supplies from other phenol manufacturers were also delayed. Imports of phenol also became costlier since the price of phenol in international markets rose from $620 per tonne in January, 1987 to $1,200 in mid-1987 and settled around $ 1,100. The price of another important raw material in the manufacture of aspirin, acetic anhydride, also rose from $750 per tonne to $950 per tonne. Thus, Indian manufacturers had to suffer from the non-availability of raw materials and their escalating prices.

The availability of raw materials has improved in the current year with the commissioning of HOC's phenol plant. The prospects for exporting aspirin have brightened, since the demand in international market has grown owing to finding new applications for aspirin. Moreover, aspirin prices have started rising in the international market, which is expected to benefit Indian producers. For exporters of aspirin, phenol from HOC will be available at international prices.

At present, there are three manufacturers of aspirin in the country. Alta Laboratories has a capacity of 1,000 tonnes per annum at its Khopoli plant (Maharashtra). Andhra Sugar at Tanuku has a capacity of 500 tonnes and Shrishma Fine Chemicals and Pharmaceuticals (Karnataka) has a capcity of 2,000 tonnes per annum. In addition, Kerala Salicylates and Chemicals, Trivandrum, is poised to start production in 1989 with a capacity of 1,000 tonnes per annum. Thus, the total capacity in the country in 1989 will be 4,500 tonnes.

Although the demand for aspirin was expected to rise progressively from 3,000 tonnes in 1986 to 5,000 tonnes by 1991, the present demand is placed at 1,800 — 2,000 tonnes per annum.

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Banning a carcinogen—govt. undecided

The Government continues to drag its feet on banning benzidine, a cancer-causing chemical, despite overwhelming scientific evidence and requests from international bodies.

The request for a phased ban of this carcinogen first came from a section of the chemical industry, worried over its grimy image as a purveyor of poisonous gases and a trader of toxic materials.

This section of the industry presented incontrovertible evidence, corroborated by studies in various countries, on the nexus between benzidine and cancer of the bladder. The industry wanted the Government to ban the chemical before the issue ballooned into a national scandal.

Benzidine and its salts have been recognised as carcinogenic by 13 countries including the USA, UK, Switzerland and the Federal Republic of Germany. Its manufacture is prohibited in Japan, and the Soviet Union has also discontinued its production.

Benzidine-based dyes, also called benzidine-azo dyes, are mostly blacks and browns used by the leather industry. Leading dyestuff manufacturers in Europe, including Imperial Chemical Industries (ICI) of the UK, gave up production of benzidine-based dyes when it was found that even after taking precautions, its manufacture involved carcinogenic hazard.

Recent studies have established that "humans as well as mammals possess the capability of changing (metabolising) the benzidine-based dyes back to benzidine". This is mostly done by the liver, but other organs also have this capability.

As early as 1979, Prof. H. Zollinger, a European dyestuffs authority, wrote to the Indian Embassy in Switzerland, pointing out that "benzidine is a very dangerous chemical — for that reason, the European, American and Japanese dyestuff manufacturers decided some years ago to stop production of all chemicals based on benzidine. It is therefore, in my opinion, not a good practice when Indian dyestuff manufacturers continue the production of such dyes."

In April last year, the Union Department of Chemicals and Petrochemicals convened a meeting of leather chemical manufacturers to discuss the issue. The Government questioned the manufacturers on the availability of other dyes to replace benzidine dyes, possibility of equipment of small-scale units becoming redundant in case of a ban and the possibility of small units making alternative dyes to replace benzidine.

It was pointed out that several alternatives to benzidine are available, like meta amino phenylene diamine, meta amino phenol and para nitro aniline. As their processing involves the same operations, there is no redundancy of equipment. The small units can shift to non-benzidine-based dyes using the same plant and machinery.

After a lapse of 10 months, the Government is yet to make up its mind, obviously under pressure from those who are engaged in the manufacture of benzidine-based-dyes. About 1200 tonnes of benzidine-dyes are produced in the country. The only manufacturer in the organised sector is Atul Products.

Atul as well as small-scale manufacturers argue that alternatives to benzidine are costlier and a change-over will affect their business, especially the export market. Almost 70 per cent of Atul's benzidine-based dyes are exported, mostly to Italy.

Atul also claims that none of its employees has so far contracted cancer. This is a fallacious argument, as cancer can appear after a lapse of 20 years or more, according to studies on victims abroad. Apart from employees engaged in dye manufacture, benzidine can affect employees in leather industry (it has been found in the effluents discharged by tanneries) as well as the ultimate users of leather goods. The carcinogen can be inhaled or absorbed through the skin.

While Atul appears to be keen on delaying a ban as long as possible, other manufacturers say they only want a committment from the Government to ban this proven carcinogen even if the ban is to be enforced after five or 10 years.

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QUALITY CHEMICALS AT ECONOMIC PRICE

Export of chemicals, and allied products

The open-house discussion organised by the Chemicals and Allied Products Export Promotion Council in Delhi recently where senior commerce ministry officials were also present turned out to be a tale of problems and difficulties experienced by the exporters.

All the representatives, whether speaking from the floor or from the dais, mainly referred to the constraints affecting exports without responding in concrete terms to the new import-export policy which was liberalised further to give a fillip to exports.

The grievances, though important, should not dominate any free and frank discussion as one commerce ministry official put it. It is equally important to point out the possible jump in exports if more concessions are required.

That way there is no end to problems which may arise from time to time and may be solved at some stage or the other.

When the commerce ministry's official drew the exporters' attention that the council's exports rose in 1987-88 because of a new item — granite, the speakers became subdued. Any way, the need of the hour is maximisation of foreign exchange earnings and the government as well as the exporting community should ensure that exports go up in coming years.

The export of the council's products, which are wideranging from footwear to books, from glass and paints to plywood, in 1987-88 amounted to about Rs. 425 crores. In the current financial year, the target has been fixed at Rs. 510 crores — an increase of 20 per cent. But the commerce ministry favours a quantum jump. In that case, the ministry should look into the difficulties, whether these relate to transport or power, with an open mind and resolve the same expeditiously.

One important point raised by exporters related to simplification of export documents. This correspondent's discussions with top-level officials revealed that the forms and documents to be filled in by the exporters might be simplified as well as reduced. Commerce and finance minister Narayan Datt Tiwari will himself take up this issue soon with the officials.

The exporters' demand for a higher cash compensatory support (CCS) will have to be supported by proper data. The issue of export credit is being discussed between various departments and some relief for exporters is expected. The official contention is that the government wants to make the exports 'profitable' so that industrialists should opt for higher sales abroad instead of remaining content with sales in the domestic market.

Exporters from the northern region suggested a cut in the railway freight rate as their units are situated far away from the major ports. This problem needs urgent attention.

Another significant issue which came up at the open-house discussion related to the wide gap in announcements and their implementation.

The items covered by the council, which can boost export earnings, include auto tyres and tubes, rubber beltings, medical and surgical rubber products including hot water bottles, paints, glass and glassware, ceramics, graphite electrodes, ossein, books and publications.

The commerce ministry officials assured the exporters that their problems would be processed soon.

In the meanwhile, trade and industry should take up the challenge of maximising exports to contain the trade deficit.

It will be helpful to the exporters if decisions on the issues raised by them are taken quickly so that they could take advantage of the same while entering into export contracts.

Chemical exports up 20 pc in '87-88

Exports of industries within the purview of Chemicals and Allied Products Export Promotion Council (Capexil) reached an alltime high of Rs. 433.4 crores in 1987-88, and at this level, there was an increase of nearly 20 per cent on 1986-87.

For the current fiscal year, Capexil has tentatively fixed a target of Rs. 520 crores, thereby aiming at an increase of almost 20 per cent on 1987-88.

According to a Capexil study, products which contributed to the higher value of exports in the last financial year, were rubber and canvas footwear, paints, flat glass including safety glass, sanitary-ware, ceramic crockeryware, barytes, granite, books and publications, graphite electrodes, vacuum flasks and refills and other rubber-based items.

The overall export performance in 1987-88 would have been higher but for the absence of certain facilities which Capexil had sought from the Union government and the shrinkage of exportable surpluses of certain items because of industrial relations problems in certain big units producing them. The second factor told on exports of auto tyres and tubes and glass bottles. Reduced import of rubber beltings by the Soviet Union was yet another factor.

The higher target for 1988-89 has been fixed in the expectation that exports of auto tyres and tubes, rubber manufactured products, paints, plywood and related items and glass and glassware would register a definite spurt. The targets for the current fiscal year and exports in 1987-88 (in brackets) are: Auto tyres and tubes Rs. 80 crores (Rs. 58 crores), rubber manufactured products Rs. 42 crores (Rs. 28.5 crores), paints Rs. 80 crores (Rs. 66.5 crores), plywood Rs. 30 crores (Rs. 16.4 crores), and glass and glassware Rs. 3 crores (Rs. 29 crores).

The task of achieving the higher target would be facilitated if certain facilities sought were allowed by the Centre according to Capexil. The facilities sought are: Relaxation of policy to permit export of sawn timber exclusively from imported logs, reduction in the furnace oil input eligibility criterion from 25 per cent to 15 per cent, expeditous clearance of proposals for setting up units to make disposable rubber.

SPURIOUS GLUCOSE-D

The Central Bureau of Investigation (CBI) has unearthed a factory engaged in the production and sale of spurious 'Glucose-D' and arrested seven people including the owner of the factory.

According to a CBI release, special crime officials raided the premises of the factory in Hauz Kazi area of central Delhi and recovered about 2,000 packets of spurious Glucose-D

Under the sea, in search of drugs

Indian scientists are looking for new drugs from the sea.

Wearing scuba gear, they descend from research ship to depths of 40 metre to collect sea forms that may one day yield powerful new drugs.

Their search off the West Coast, Lakshadweep Islands and Mandapam is for unusual compounds in sea flora, fauna and microbes that can serve as models for new drugs.

The oceans harbour some 400,000 species of plants and sea animals and 10 per cent of them are likely to yield biologically active compounds.

The drugs of tomorrow may come from sea sponges, algae, corals, seasquirts, puffer fish and soft-bodies hares if the mission to fish out the medical gifts from the sea is successful, say scientists.

The search for bioactive substances from the Indian Ocean is a 1.4-million dollar venture between India and the US.

The Indian sponsor is the Council of Scientific and Industrial Research (CSIR) and the US sponsor is the US Office of Naval Research (ONR).

The project initiated in July, 1984, involves more than 100 scientists in the two countries.

The National Institute of Oceanography (NIO), Goa, Central Drug Research Institute (CDRI), Lucknow, and the Bose Institute, Calcutta, are jointly involved in the project.

The American participants are the Stevens Institute of Technology, Hoboken, Osborn Laboratories, Brooklyn, and the University of Southern California, Los Angeles.

Indian scientists have collected 430 marine specimen, of which 35 have shown signs of anti-microbial and anti-viral activity.

Dr. C.G. Naik of NIO says scientists collected samples several times along the Indian West Coast from Port Okha in the north to Kanyakumari in the South.

Scientist-divers have also picked up samples of corals off the Lakshadweep Islands.

Dr. Naik says while NIO conducts identification of collected samples, the Lucknow-based CDRI extracts the biologically active compounds from the samples for testing drug qualities.

The scientists point out that sea organisms make some of the most lethal poisons known to protect themselves.

Hard corals are protected by their thick skeletal frame and cells that contain a powerful sting.

Sea sponges that have no obvious means of protection release chemicals that repel or kill marine algal spores or larvae.

Some species have novel chemical defences against predators. The soft-bodied sea hare, for example, survives without a spiky shell. Its armour is its awful taste acquired by eating certain algae and preserving their toxins in its skin.

If the poisons collected from marine organisms are given in very low dosages to humans, they may work against cancer and other diseases, scientists say.

There are several possible routes to developing sea pharmaceuticals.

The most direct approach is to extract the desired compound from the organism itself. A large number of organisms have to be collected for this purpose.

But many potentially interesting organisms live in waters too deep or inaccessible to make regular collection practical.

Scientists say recent advances in molecular biology, however, have opened up other avenues. One route is to copy the natural product or even improve upon, it, by chemically synthesising it in the laboratory.

Another option is genetic engineering. By borrowing from the organism a gene that controls production of the desired substance and introducing it into bacteria, researchers can make the bacteria turn out the substance in industrial quantities.

Recent studies on sea flora and fauna have led to following applications:

— A study of an ocean worm with unusual toxic effect found in the waters surrounding Japan have led to development of a new pesticide, padan, to protect rice crops.

— The Mediterranean waters off the Coast of Sardinia yielded a fungus which produces a weak antibiotic. Using this compound as model, scientists produced a family of antibiotics called 'cephalosporins'.

— From the Caribbean Sea, chemicals produced by sponges were used as models for a new drug 'Ara-C' against herpes and some types of cancer.

Scientists think that the Indian Ocean, being much warmer than other oceans, will provide an even more abundant source of new compounds.

According to Dr. Gerald J. Bakus, Professor of Biology, University of Southern California, the Indian Ocean is unchartered waters in the search for antibiotics, biodegradable insecticides or potential anti-cancer drugs.

"The Indian Ocean, exposed to long periods of intense sunlight, contains flora and fauna which reproduce at an accelerated rate compared with other major bodies of water in the world", says Dr. Ajay K. Bose, Professor of Chemistry at the Stevens Institute of technology.

"The Indo-US project began slowly but is in full operation now. Marine specimens are being analysed by Indian and American scientists," a NIO official says.

Seven Indian scientists have so far been trained in scuba diving.

At the Stevens Institute, Indian scientists learn about advanced instrumentation and special techniques for analysing samples they collect from the sea.

At Osborn Laboratories Indian scientists learn to measure the biological activity of marine samples.

A project entitled 'Drugs from the sea' was initiated by NIO and CDRI in 1978 but it was not until 1984 that it took a major shape under the Indo-US agreement, officials say.

"We are hopeful about discovering new compounds of medical importance in the near future because of similar discoveries elsewhere," says a scientist at NIO.

Major liberalisation in licensing

In what is seen as the most significant liberalisation measure taken in the last three-and-a-half years, the Union Govt. announced at New Delhi on June 3, its decision to exempt from licensing all indl. investments made by non-MRTP and non-FERA companies up to a limit of Rs. 50 crores, if these are located in any of the Centrally declared backward areas, and up to a limit of Rs. 15 crores, if these are located outside specified units of 21 cities.

Simultaneously, the Government has reduced the number of industries, for which licences have to be compulsorily obtained. Their number, earlier estimated at 56 and categorised under Schedule IV and Schedule V of the licensing policy, will now stand reduced to 27. The two schedules will also be merged into one.

Another decision pertains to the raising of the foreign exchange requirement level of projects exempted from licensing. At present projects requiring foreign exchange for imported raw materials (other than steel and specified items) and components for less than 15 per cent of the value of ex-factory production from the first year of commercial production or Rs. 75 lakhs, whichever is less, do not require any licensing.

As per the announcement only projects which require foreign exchange for imported raw materials and components for more than 30 per cent of the value of ex-factory production from the first year of commercial production will have to obtain licences.

The Government has also taken some major decisions on development of growth centres in the country and provision of financial and monetary incentives for units located in the backward areas. All these decisions were taken at the meeting of the Cabinet Committee on Economic Affairs at New Delhi on June 2. Necessary notifications to give effect to these decisions would be issued soon.

Briefing media persons about these decisions, the official spokesman of the Union Government said the entire package of liberalisation measures was a reflection of the Government policy to move away from a system of administrative regulation of industrial development through licensing to a concept of growth centres.

In the first category, the cities covered are Delhi, Bombay, Madras, Calcutta, Bangalore, Ahmedabad and Hyderabad. The second category covers only Pune and Kanpur, while the third covers the remaining 12 cities — Nagpur, Jaipur, Lucknow, Coimbatore, Patna, Surat, Madurai, Indore, Varanasi, Jabalpur, Agra and Vadodara.

The new list of industries, where licensing is compulsorily required, supercedes the existing schedules IV and V of the notifications under the IDR Act. This special list (given at the end of the report) now excludes 29 industries, earlier listed in these two schedules. Schedule IV industries made licensing compulsory even for small units, while schedule V industries made licensing compulsory for units other than small.

The industries, which now do not require compulsory licensing, include bright bars, tin containers and metal containers, drums and barrels, hamilton poles, tubular poles, sheet metal components, sheet figured and wired glass, transmission line towers, sewing machines (hand operated), dairy machinery industry, food processing machinery and equipment industry, all types of rubber based conveyor beltings, PVC conveyor beltings and fans and V belts, carbon black, computers, mini computers, micro-processor based systems, dry batteries, welding electrodes, overhead cranes, railway wagons, nylon chips, industrial explosives, polyester chips, LPG valves and regulators, watches, TV receivers and wide range of chemicals and pesticides like malathion technical, endosulfan technical, 2-4-D, synthetic pyrethroid and formaldehyde.

As regards the need to promote industrialisation of backward areas in an effective manner, the Government has decided to shift the focus on development of growth centres, that would act as the magnet for attracting industries to backward areas. Such growth centres would be endowed with infrastructural facilities on par with the best available in the country, particularly in respect of power, water, telecommunications and banking.

At least 100 such growth centres would be developed throughout the country over the next five years, according to the Government decision. Each growth centre would be provided with funds of about Rs. 25-30 crores in order to help them create infrastructure facilities. Total investment of about Rs. 2,500-3,000 crores was thus envisaged over the next five years for creating efficient and sound infrastructure facilities in selected growth centres.

The Government, he said, had realised that the policy of licensing and providing capital subsidy for investment in backward areas had not paid off. As a result the move was towards physical planning for backward areas industrialisation through the creation of growth centres, where adequate infrastructure would be provided by the authorities.

He clarified that the capital subsidy schemes and other incentive schemes for industries in backward areas, as classified in Category A, B and C districts, would continue for some time. However, these schemes' were being separately reviewed, although these are not being abolished at present.

A senior official in the Industry Ministry explained that with thi delicensing, the task of channellin investments in desirable and high priority industries would be per formed by the financial institution which would continue to screen ap plications for financing new project and expansions. He also explaine that the list of industries, for whic licensing was compulsory, was redu ced with a view to moving awa from the concept of imposing cor trols on capacities to one of allow ing free competition.

The implication of the Goverr ment decision is that an investmer of up to Rs. 50 crores can be set u without obtaining any licence, pr vided it is located in a backwa area. The other implication is th an investment of up to Rs. 15 cror will not require a licence, provid it is located anywhere except with the specified limits of 21 cities.

The specified limits of the citie outside which investment of up Rs. 15 crores will not need a licenc are: (a) 50 kilometres of t

periphery (i.e. boundary of the urban area city limits) of cities having a population of more than 25 lakhs, (b) 30 kilometres of the periphery of cities having a population of more than 15 lakhs but less than 25 lakhs, (c) 15 kilometres of the periphery of cities having a population of more than 7.5 lakhs but less than 15 lakhs and (d) the standard urban area/municipal limits of other cities and towns.

The funds for this purpose would be found by the Union Government, states, and all-India financial institutions. As the need arises, more growth centres would be identified. But for the present, these growth centres would be located within a reasonable proximity of district headquarters or tehsil headquarters in backward areas at such places that have a good potential for attracting industries.

A committee of secretaries and representatives of all-India financial institutions, headed by the Planning Commission Secretary, is being appointed to formulate the criteria and guidelines for the selection and location of the growth centres. The states will be asked to submit their proposals for location of growth centres in accordance with these criteria.

The spokesman said after developing the 100 identified growth centres, development of growth centres would be expanded further over the next 10-15 years, so that most of the backward areas in the country are covered. The ultimate objective was to develop one growth centre in each of the 430-odd districts in the country.

The spokesman clarified that even now some growth centres had been established in some States. But the allocation for developing these centres was a measly Rs. 6 crores, compared to the proposed Rs. 25-30 crores for the 100 centres to be identified. In view of inadequate funds, the existing growth centre concept has failed to take off.

He reiterated that the development of growth centres would be in addition to the existing backward areas scheme and was not in substitution of it. However, the backward areas scheme would be reviewed periodically with the progress in the establishment of growth centres and such modifications would be made as are needed.

It has been decided that the existing fiscal benefits like income-tax relief under Section 80 HH of the Income Tax Act by way of deduction of 20 per cent of the profits for 10 years for units established in Centrally declared backward areas, income-tax relief by way of deduction of 25 per cent of the profits for eight years for new units, cumulative benefit of these two concessions for units located in a backward area and the reintroduced investment allowance would all be available to industrial units to be established in the proposed growth centres as well as the notified backward areas.

Simultaneously, it is decided that in order to provide greater assistance, the norms for working capital funds, required by industrial units established in backward areas would be reviewed and they would be accorded a more liberal treatment. The committee under the Planning Secretary would also look into this matter and make suitable recommendations.

It will be recalled that prior to this decision, the licensing exemption limit was only for an investment up to Rs. 5 crores. There was no special licensing exemption for investment in backward areas. But now both the exemption limit has been raised and the exemption has been introduced for backward area investment.

MANG. CEHMICALS

Mangalore Chemicals and Fertilisers has achieved a sales of Rs. 81.02 crores during the first nine-month period ended March, 1988 against Rs. 71.13 crores during the six-month period ended December, 1986.

It has earned a gross profit of Rs. 6.43 crores during the period against Rs. 3.70 crores. After depreciation (Rs. 5.49 crores against Rs. 0.88 crore) the net profit amounted to Rs. 0.94 crore against Rs. 2.82 crores.

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Bid to achieve breakthrough in superconductivity

The world of superconductivity is sizzling again with scientists round-the-globe working over-time to achieve new breakthroughs.

A Japanese company recently claimed to have achieved a breakthrough in the manufacture of high temperature super conductors by making thin films which show no resistance at 91K.

Although there have been many advances in achieving superconductivity at even higher temperatures, making superconducting compounds into usable forms such as wires and films was considered a major stumbling block in exploiting these successes.

According to reports the technique involves plasma spraying of the oxides at low pressures between one-fortieth and one-quarter of an atmosphere on a chamber containing ambient gas.

This, it is claimed has proved much more successful than previous approaches involving plasma spraying at atmospheric pressures.

One of the advantages of the new technique is that the film adheres more effectively to the substrate. The technique has produced films that are 100 micrometres thick, show no resistance at 91K and have a critical currennt density of 700 amperes per square centimetre at 77K.

The Meissner effect where superconductors repel magnets, occurs at 77K. It is also claimed that the technique is at least 1000 times faster than non-spraying techniques which lay the film down at a speed of less than 0.05 micrometres per minute.

Another interesting finding reported recently has been the development of an electric motor based on high-temperature super-conductors in the US.

Called the Meissner motor, it revolves 50 times a minute and operates by the Meissner effect.

The motor consists of a 20 cm aluminium plate with small electromagnets mounted along the bottom of the outer edge.

The plate rotates above two discs, made of yttrium-barium copper oxide, which becomes a superconductor at about 94 K.

The repulsions between the eletromagnets and the superconductor spins the plate.

According to a researcher, "the motor, through producing negligible power, has been built to demonstrate that simple, operating motors can be made with super-conducting ceramics."

Yet another significant advance in the field has been the recent discovery of a new class of copper oxide ceramics that carry electric currents with zero resistance at liquid nitrogen temperatures (77 K and above).

Unlike the previously discovered high-temperature superconductors which contain 'exotic' rare earth elements the new materials consist of relatively common, in-expensive elements.

The scientists are now trying to convert these brittle superconducting materials into wire and film. The new compounds could make large-scale applications of superconductivity more economical in future.

This breakthrough has been achieved by teams of American and Japanese researchers.

Two compounds have been developed by these researchers. While one group made a compound of bismuth, strontium, calcium, copper and oxygen, the other compound through apparently similar, contains aluminium in addition to these elements. Aluminium, however, is not an important constituent.

The new compounds begin to superconduct at temperatures as high as 127K and 114K respectively, it is claimed.

Preliminary, x-ray studies indicate that the crystal structures of the newest superconductors is different from that of the so called 1-2-3 superconductors discovered in early 1987.

The first member of the 1-2-3 class was an yttrium-barium-copper oxide that is fully super-conductive at about 90K.

The findings have also been confirmed by another group which made the same compound superconduct at 80K.

According to researchers, high temperature superconductors have a wide-range of potential military applications as well.

Such applications for superconductive materials range from bearings and motors to gyrotrons and free-electron lasers. They may also be used for microwave/millimetre-wave sensors, and to connect logic and memory chips in computers.

The US Defence Department is giving a boost to the search for practical application of superconductivity, and has decided to fund 20 teams to participate in its high temperature superconducitvity programme.

The programme, sponsored by the Defence Advanced Research Projects Agency and the Office of Naval Research, will concentrate on the process to manufacture superconductor materials as much as the development of new superconducting devices.

The three areas of emphasis will be to develop the processes to fabricate superconductive materials in general shapes and sizes, to devise controls for the manufacturing processes to permit high-quality mass production, and to develop new superconducting devices.

The US is also considering constructuring the biggest atom smasher — the superconducting super collider (SSC).

The SSC is a project of the Department of Energy and is expected to cost $ 4.4 billion at 1988 prices and scheduled to be completed in 1996.

Besides saving phenomenal amount of energy, superconductivity opens up new possibilities like high-speed bullet trains, electric cars, computers miniaturised many times despite being more powerful, safer nuclear reactors producing more power among others.

In short, experts are of the opinion that the technological advance would mean a technological revolution with a potential impact as great as the industrial revolution.

India, significantly has been in the forefront of this race.

Superconductivity in layman terms means electrical conduction without any resistance on the part of the wire carrying the current, in other words what is put in at one end is received in full at the other without any loss.

POLLUTION CONTROL ACT

23 Gujarat units served show-cause notices

The Union Government has served show cause notices to 23 industrial units in Gujarat under the Environment Protection Act 1986, for violating pollution control, out of 37 cases recommended by the Gujarat Pollution Control Board.

This was disclosed by Lt. Gen. K. Mahipatsinhji, Chairman, Gujarat Pollution Control Board, while addressing a press conference at Ahmedabad recently. He also disclosed that the Centre has not taken such steps against any such defaulting unit so far.

He also informed that the Rs. 90-crore sewage treatment plant for the Sabarmati river under the World Bank programme, will be completed by 1990.

According to the Lt. Gen., it is strange but true that the total amount of effluents from the GIDC estate and municipal corporations and nagar panchayats amounts to almost 2,000 million gallons per day and if this water is treated and utilised for irrigation, it will be a tremendous boon to the drought stricken areas. "We can also utilise the municipal waste for producing energy and useful manure," he added.

He pointed out that the Pollution Control Board is advocating recycling of water to all the industries as GNFC, IFFCO, Kalol are recycling 75 to 80 per cent of their water. Similarly, Tatas at Mithapur are generating 100 per cent of their requirement of water through desalination and a flash distillation plant. The Board is also advising industries to adopt measures to cut down the requirement for distilleries and dry process for pulp and paper industries as is the practice in Canada. Water can even be treated and recycled in process houses.

Lt. Gen. Mahipatsinhji pointed out that bulk of the water pollution from industries comes from the 10 major chemical industrial estates of Gujarat. Small-scale industries do not find it viable to carry out secondary treatment and therefore it has been conceptually accepted that a common collection system and common treatment plant should be considered for all the industrial estates to ensure survival of small-scale industries.

In this connection the Chief Minister has ordered a working group headed by the Commissioner of Industries to go into the problem and suggest a solution. The report is likely to be submitted by July, 1988. However, work in some of the GIFC estates has already started.

For example, in Nandesari, the treatment plant is ready for commissioning. Similarly, the collection system in Vapi is almost complete and so at Pandesara. The work is also under progress in Ankleshwar.

INSA MEDAL FOR 14 SCIENTISTS

Fourteen scientists below the age of 32 have been selected by the Indian National Science Academy (INSA) for the "INSA medal for young scientists," for 1988.

The awardees will receive a cash award of Rs. 5,000 and a medal. They may also be considered for a research grant not exceeding Rs. 20,000 a year including a stipend for a junior research fellow for three years.

The list of awardees was finalised at the general meeting of the INSA council held at the National Chemical Laboratory at Pune, recently.

The awards will be presented at the annual general body meeting of INSA at New Delhi, on Oct. 5.

The awardees are Dr. V.K. Arora of the Department of Soils, Punjab Agricultural University, Ludiana, for developing and testing a model for predicting water use and irrigation scheduling in wheat.

Dr. M.M. Chaturvedi a lecturer in the biochemistry laboratory, Department of Zoology, Bannars Hindu University, Varanasi for his studies on conformational and functional changes during ageing.

Dr. A. Jayaraman a scientist at the physical research laboratory, Ahmedabad, for his outstanding contributions on the role of aerosols in the troposphere and the stratosphere.

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S & T IN EIGHTH PLAN

High power group set up

The Planning Commission has set up a high power steering group under the chairmanship of Prof. M.G.K. Menon, member, Planning Commission, to formulate the Eighth Five Year Plan (1990-95) for the science and technology sector.

The steering group is expected to recommend a policy framework and guidelines for the rapid development of science and technology in the country and ensure its application as an integral part of socio-economic development as also to assess performance viz-a-viz targets and objectives during the Seventh Plan with a view to highlight the achievement as well as shortfalls.

It would indicate areas of national priority in the science and technology sector, identify specific tasks/programmes to be implemented by various scientific departments/agencies individually or in a co-ordinated manner, make specific recommendations in respect of policies and procedures for strengthening S & T and improving the quality of the educational system.

The group has also been asked to work on special mechanisms for evolving and implementing schemes for application of science and technology for the benefit of society, particularly for the weaker sections and women, and for reducing regional imbalance. The group is also required to define policies/measures for effective and rapid development and application of S & T in production and services sectors, and to suggest specific schemes/programmes for generation of employment.

In addition, the steering group has been asked to suggest and assess optimal expenditure/outlay in the S & T sector as a percentage of GDP keeping in view the resource position and needs of other sectors.

The chairman of the 37-member group has been empowered to co-opt experts and constitute sub-groups for specific tasks. The steering group will be serviced by the Planning Commission. Dr. (Mrs) Manju Sharma, chief (science), in the Planning Commission has been named as the member-secretary of the group.

The group has been asked to submit its report in nine months time after receiving the reports from various working groups.

Complete footwear

The government is to be congratulated on its timely offer of a fresh liberalisation package to the leather industry. This industry has made remarkable strides in the last 15 years, especially on the export front, and it is no wonder that the Council for Leather Export is confident of achieving an annual export growth rate of 20 per cent and raising the value of exports to nearly Rs. 6,000 crores by the turn of the century. Various studies have indicated that the main thrust will have to be on the export of complete footwear. In this area, India's share in global exports is almost negligible, as only less than 15 per cent of the country's footwear production is in the organised, modern sector. The cottage and small-scale sectors, which account for the bulk of production, cater mainly for the domestic market. The accent should, therefore, be on rapid modernisation of the entire industry, starting from the tanneries.

The new measures announced by the government have precisely this objective in view, although a section of the industry has been demanding that no licence should be required for an investment upto Rs. 1.5 crores. The broad-banding facility now extended to footwear and leather goods manufacturers will enable exporters to adjust their product-mix to changes in the international demand pattern. This facility has already been extended to other industries, with beneficial results. The finished leather sector has also been given a fair deal by way of liberalisation of licensing of new units and substantial expansion of existing units. While permitting the creation of additional capacity in the finished leather sector, the government will keep in mind the need for regional dispersal in order to avoid over-saturation in areas where the industry is already concentrated. Some circles in Tamil Nadu, which is one such area, fear that the new policy will come in the way of further expansion of tannery capacity in the state. A task force on tannery pollution has highlighted the enormous damage caused to the environment by the pollutant from tanneries. Further expansion of tanneries in Tamil Nadu under the guise of modernisation will only aggravate the pollution problem.

In licensing new tannery capacity, especially in the small-scale sector, the government will do well to follow the recommendation of the task force to set up leather industry zones on the outskirts of urban areas with a three to five km radius of green belt.

— Economic Times

NEW DRAWBACK RATES: ILPA SORE

The Indian Leather Products Association (ILPA) has expressed the disappointment of the manufacturers and exporters of leather products in India with the newly announced duty drawback rates of duty drawback effective from June 1, 1988, which show no increase in the rates for leather and leather goods, for the second consecutive year.

According to Mr. S.S. Sawhney, President, ILPA, the trade had been hopefully looking forward to a minimum increase of five per cent to ten per cent on the existing rates.

In a statement issued recently Mr. Sawhney said he is unable to understand the rationale behind the non-increase in the rate of duty drawback for leather and leather exports, keeping in mind the fact that the Centre had identified the sector as a thrust sector.

He felt that the Government should have shown some consideration to the leather and leather products sector which is having to face spiralling costs since the duty drawback rates were last announced. He expressed disappointment that the Government is not encouraging a sector which has been a consistent foreign exchange earner for the country.

Shaw Wallace not moving out of fertilisers

Shaw Wallace has no plans to move out of fertilisers. It was and it continues to be the company's major area of concern and activity.

This was stated by Mr. K.P. Jaykar, vice president of Shaw Wallace when asked whether its decision to seek the winding up of its 90,000-tonne super phosphate plant at Avadi, near Madras was due to the fact that the unit was incurring losses and because all was not well with the fertiliser industry as such

The chief labour commissioner of Tamil Nadu, recently ruled against an application from the company, seeking permission to close down the Avadi unit, with a labour complement of 150 workers. He refused to permit the closure, as in his view the reasons advanced for winding up lacked "genuiness" and apparently felt that the company wanted to close the loss making unit taking advantage of certain decisions taken by the Madras Metropolitan Development Authority (MMDA) to shift industrial units drawing heavy power, from residential areas to alternate sites. The municipal authorities at Avadi also had been campaigning for shifting of the factory set up a little more than three decades back.

The chief labour commissioner told **The Economic Times** that there are provisions for appeals against such decisions (seeking shifting of factories to alternate sites). The Pollution Control Board had no objection to the factory. Therefore if the unit was interested in continuing with its operations, it could take recourse to procedures laid down.

Mr. Jaykar when contacted said the authorities had earlier given permission to operate the unit at the present site till 1990, but the municipal authorities had withdrawn the permission. If the unit continued with its operation it would be violating the law. The winding up of the unit was therefore sought, which had been denied. "If we closed down we will be again violating the law".

He said the unit was in a devil and deep sea situation as a result of mutually contradictory stances of different wings of the government. Asked what were the difficulties in removing the factory to an alternate site, he said it would be uneconomical.

The plant and its equipment were three decades old. The shifting the Rs. two crore factory would cost four times more. Besides the factory was set up under different regulations existing then. Under the current regulations, the factory when moved, would be deemed as a new unit and a fresh industrial licence would have to be obtained. These were the practical difficulties, he added.

A spokesman for the MMDA said there was no change in the policy of shifting industrial units drawing heavy power from congested areas to alternate sites. The affected parties are helped in finding alternate sites. The policy is applicable to all and many units have complied with it. Shaw Wallace can be no exception, he said.

FERTILISER DISTRIBUTION

Decontrol planned

The government is reportedly planning to do away with the controls on fertiliser distribution. At present fertiliser allocation is made under the Essential Commodities Act writes Pradeep Puri in the **Economic Times.**

It is believed that the decontrol would result in a substantial reduction in fertiliser subsidy.

Currently each unit is allocated a state or a group of states by the agriculture ministry to sell the quantity earmarked for it. Any violation of this allocation is punishable under the Essential Commodities Act

This allocation, based on the expected consumption indicated by the state government, is essentially to avoid criss-cross movement and also to ensure that even the low-consumption areas get their share of fertilisers. Since the selling prices of fertilisers are ex-factory, the fertiliser units are reimbursed freight based on the average lead called the equated freight.

A decontrol of fertiliser movement would mean virtually free marketing of fertilisers. Apparently the reason for the current thinking is to save on freight subsidy, though freight is the actual reimbursement on equated basis incurred by the manufacturer.

Another reason could be that the government, by allowing the manufacturers to freely market their products anywhere in the country, will be "morally" free from paying the inventory carrying cost.

The government's seriousness to do away with fertiliser distribution control is evident from the fact that already SSP manufacturers have been allowed to sell their unallocated quantity to any state of their choice. Similarly, DAP and complex grade manufacturers can sell their unallocated quantity in any state of their marketing zone, subject to the condition that in both the cases manufacturers would not be reimbursed the extra freight they may incur.

For kharif 1988, the government allocated only 60 per cent of urea and 75 per cent of the phosphatic fertilisers indigenously available. In the rabi 1987-88 also, the government allocated 58 per cent urea and 62 per cent phosphate.

The balance quantities have to be carried forward by the manufacturers for the next season. This entails heavy inventory carrying cost. The government, in its anxiety to reduce subsidy, has not so far agreed to reimburse this extra inventory carrying cost, despite repeated promises at the highest level.

Industry circles feel that doing away with the distribution control would stunt the progress of agriculture and virtually make the fertiliser industry sick. It is felt that in the event of free marketing of fertilisers, the manufacturers will be tempted to move their products where there is a demand and the low-consumption and rainfed areas will be left high and dry.

Knowledgeable sources are also of the view that there would not be any worthwhile development of the market as the manufacturers would be shifting from one area to another depending on demand.

Western offshore output potential to go up

With the recent discovery of a link between two major oil-bearing structures, which were taken to be independent of each other so far, the crude production potential of the western offshore is expected to move up by 0.4 million tonnes per annum

According to informed sources, the new field, designated as Neelam by the Oil and Natural Gas Commission (ONGC), has emerged following the discovery of a 32-metre oil column in recently-dug well No. 7 on B-131 structure, establishing its link with an earlier structure, B-132.

The aerial extent of the Neelam field is anticipated to be 86 sq. km. The tentative geological reserves of oil and oil equivalent of gas (OEG) are put at 155 million tonnes (140 million tonnes oil and 15 million tonnes gas). The expected recoverable oil from the field is about 43 million tonnes. With a production potential of 0.4 million tonnes of oil per year, the Neelam field is being considered as a major discovery in the western offshore by the official circles in New Delhi.

The B-131 and B-132 structures are recent discoveries. While oil and gas were struck in January 1987 at the B-131 structure, the discovery of oil and gas at B-132 was made in June 1987. So far, 11 delineation wells have been drilled in a record time of 16 months on these structures.

A detailed technological scheme is being prepared by the Institute of Reservoir Studies, Ahmedabad, which is expected to be submitted by August next. A simulation programme developed for the field is being applied to bring out the various techno-economic aspects like the requirements of platform wells, the level of investment, internal rate of return, production potential, etc.

Informed sources in the Ministry of Petroleum and Natural Gas say that the Neelam field is being considered for development in an integrated manner alongwith the development of the adjoining fields. The existing Heera-Uran trunkline is being planned to be used for the flow of oil and gas to the shore.

The western offshore has 208 prospects of which 90 have so far been drilled. Over the years, the total oil reserves in the western offshore have increased from 512 million tonnes (as on January 1, 1975) to 1996 million tonnes (as on January 1, 1987).

Similarly, the gas reserves have also recorded an over 10-fold increase. The gas reserves have increased from a meagre 78 billion cubic metres (as on January 1, 1975) to 831 billion cubic metres (as on January 1, 1987). Twentyfour new discoveries have been made in the western offshore since 1980, comprising 13 oil, five oil and gas and six gas discoveries.

At present, the production from the western offshore is being sustained from Bombay High, Heera, Ratna and Panna. Bombay High was the first major success in the western offshore. The production from this field was started in May 1976 and which has been gradually raised to around 430,000 barrels of oil per day. Production from Ratna field, south of Bombay High, commenced in November, 1982. Heera field was put on production in Mar 1984 and production from Pan field started in December 1986.

Some of the other major fields u der development or planned f development are Tapti, D-18, D D-II, B-57, B-134, B-178, B-179, I man offshore and South Bassein. T first phase of the South Bassein fi development has already been co pleted. Efforts are on to recov oil from the thin rim of South B sein, using horizontal drilling tec nology.

The Tapti field comprising thr structures — north, south and m Tapti — is mainly a gas field. ONG has submitted proposals for inve ment decisions for the develo ment of the field.

A novel scheme has been laun ed by ONGC in floating early p duction system for exploitation some of the newly-discovered str tures in the western offshore. " floating production system will extremely useful for collection reservoir data at an early stage w ch will help in reducing the t taken to formulate the final de lopment plan by at least two three years.

In offshore, the first early proc tion system, Sagar Lakshmi, commissioned in December, 1986. the Panna field. ONGC is now c sidering to deploy the floating p duction system at D-18 structure cated 40 km. south-west of Bom High.

The concept of floating early p duction system would gradually introduced to other structures well. This would also give experi ce to ONGC to operate similar ty of system for production from de er waters in future.

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ICCL to go on stream by December

The Indian Charge Chrome Limit- (ICCL) coming up in Sukinda-asahi-one of the world's best de-sits of high grade chrome ore is set to commence production from cember.

The modern plant, built at a cost Rs. 49 crores in technical colla-ration with Elkem of Norway, a ding global ferro alloys manufac-rer is 100 per cent export oriented th an annual production target of 500 tonnes.

Promoted by the Indian Metals d Ferro Alloys Limited (IMFA) up, the ICCL has set up its first phisticated 108 mw captive ther-l power plant to meet the entire ergy requirements for charge rome production.

An ICCL spokesman told repor-s that the Rs. 169 crores fully nputerised power plant located at 273 acres plant complex at owdwar about 15 km from Cut-k is ready to be commissioned in fortnight.

The power plant, said to be the gest of its kind in the country's vate sector, has been installed by Swedish consortium, he added.

According to an estimate, Orissa, th deposits of around 150 million nes of chromium ore at Sukinda d Baula mines of Keonjhar and lasore districts respectively, vir-lly contains 90 per cent of the al chrome ore resources in In-.

To exploit these vast resources and meet the shortage of charge chrome which has emerged as one of the most strategic ferro-alloys in the world, the IMFA, Ferro Alloys Corporation Limited (FACOR) and the government-owned Orissa Mining Corporation have made a significant breakthrough in carrying out mining operations in the areas.

Dr. Bansidhar Panda, a scientist turned industrialist and the promoter of IMFA is the first to commission a 50,000 tonnes per year charge chrome plant in 1983 at Therubali in the tribal district of Koraput.

Shortly after FACOR, another major producer of Ferro Alloys in India also set up a 50,000-tonne plant at Randia near Bhadrak in Balasore district.

The Orissa government hoping to exploit these rich minerals jumped into the fray through its own mining corporation by setting up a similar plant at Bamnipal in Cuttack. But an important feature of all these plants is that they are all 100 per cent export oriented units designed to feed the growing international market without having captive power units.

The spokesman said owing to severe shortage of power in the state and in the absence of captive power plant, work was affected and production at these plants was not consistent since their inception.

This was despite their having the necessary manufacturing infrastructure and requisite quantities of chrome ore, he said.

COAL CONSUMPTION MAY GO UP TO 210 M.T.

Coal consumption in the country is expected to increase to about 210 million tonnes from the present 180 million tonnes by the end of the Seventh Plan, the Union Minister of State for Coal, Mr. C.K. Jaffer Sheriff said.

Inaugurating the third national convention of mining engineers at Neyveli, he said lignite consumption is expected to rise to 21 million tonnes from the present 19 million tonnes by the end of Ninth Plan.

Mr. Sheriff said introduction of modern mining technology would not be beneficial in developing countries like India because of severe constraint of capital resources, particularly in foreign exchange.

NATURAL RUBBER OUTPUT UP 14,047 TONNES

Production of natural rubber in the country during the first 11 months of 1987-88 was a record 221,717 tonnes, registering an increase of 14,047 tonnes over that of the corresponding period of the previous year.

Production of synthetic rubber during 1987-88 was 43,822 tonnes as against 38,816 tonnes during 1986-87.

Consumption of rubber during the 11-month period was 262,030 tonnes, registering a growth of 11.5 per cent.

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Sponge iron plants at Vijayanagar, Daitari under study

The Union Government is examining the possibility of setting up one-million tonne sponge iron plants at Daitari in Orissa and Vijayanangar in Karnataka. The earlier proposal for setting up steel plants in both these places was until now in cold storage.

The current thinking of Mr. M.L. Fotedar, Minister for Steel and Mines, and Mr. V. Krishnamurthy, Chairman, Steel Authority of India Ltd. (SAIL) is that large integrated sponge iron plants can be set up combining direct reduction of iron ore and electric arc furnaces. These plants will produce sponge iron only as a intermediary product, all of which will be used immediately to produce steel.

However, the Vijayanagar plant is not likely to receive favourable attention due to political considerations. The economics and feasibility of setting up a one-million tonne sponge iron plant at Daitari is currently being examinned by SAIL.

If this comes into being, the scrap requirements of SAIL can also be met, avoiding imports. Daitari iron ore can also be used for Rourkela because of depleting reserves at Barsua, a captive mine of Rourkela, which according to experts, will not satisfy the specifications after modernisation. A preliminary survey is in support of the proposal. These details might be incorporated in the white paper being prepared by the Department of Steel, SAIL is expected to play a big role if this proposal materialises.

The possibility of merging Vizag steel plant, as soon as it goes on stream, with SAIL is also under study. According to knowledgeable sources, Vizag may not be able to hold out on its own in view of its high costs per tonne of steel and its viability may prove a big drain on the economy unless it merges with SAIL. The fate of MECON, as an independent entity, is also hanging in balance particularly when the tenure of its present Chairman, Mr. P.C. Laha, is coming to an end. It is likely that MECON will be brought under the umbrella of SAIL and a SAIL nominee posted as its chief.

Incidentally, Maharashtra Electro-Smelt Ltd has been taken over as a subsidiary of SAIL and discussions are under way for involving SAIL in a bigger way in the running of VISL of Bhadravati in whi-

With regard to the sponge iron plants, the private industrialists see a good future for the industry and are interested in the one-million tonne per year unit based on gas.

State industrial development corporations like in Gujarat, Maharashtra, Bihar and Karnataka are also interested, the first two for plants based on gas and Bombay High oil and gas field. The issues which most concern the planners are the availability of the cost of the reductants. Sponge iron plants produce excess energy. A 1.5-million tonne per annum unit produces about 9 mw which is just less than the needs of the downstream plants.

So far, the Government had resisted allowing gas to be used for iron reduction. The current high price of gas at Rs. 2,500 per 1000 cubic metres makes gas questionable for reduction of iron. On the other hand, gas reserves are large and expanding. Recoverable reserves will last for 45 years for the currently planned uses, mostly for fer-

tilisers. If the prices [illegible] in line with equivalent fuels, a case can be made that gas will serve well for sponge iron production.

Coal is also available in abundance particularly low quality coal which is being used successfully in large sponge iron plants elsewhere in the world. For the long-term and for the majority of the future sponge iron units in India, coal seems to be the reductant that will be most promising. The major disadvantage of coal is that technology is still underdeveloped world-wide. There is not much reliable cost data for construction or operation. Each case has to be evaluated on its own technical merits, on especially regarding the way coal and iron ore react with one another.

The first commercial sponge iron unit in the country with 30,000 tonnes per year capacity commenced production in 1980 and second in 1983. The third with 1.5 million tonnes per year capacity was started in 1986. While licences have been registered by over 30 concerns for plants with a total of six million tonnes per year, none of these plants has resulted in actual investment or construction.

Granite mining project in Bihar

The first Rs. 9.65-crore granite mining project in Bihar would be taken up in Palamu district by the Bihar State Mineral Development Corporation (BSMDC).

The project has been prepared by the Metallurgical Consultants of India (MECON) at Ranchi. It includes a processing plant and would produce 5,000 cubic metres and polish 41,300 square metres of granite per annum.

Granite, a building construction material, has a great demand in the European countries and would be exported, the BSMDC Chairman, Mr. C. S. Jha said.

Mr. Jha said the newly-opened kyanite mines at Jyotipahar and Sirboi in Singhbhum diistrict produces kyanite worth Rs. 29 lakhs.

The new Government approved projects are graphite beneficiation plant at Bishrampur in Palamu, Magnetite benefication plant also in Palamu, micapaper plant in Jhumri Telaya and reconstruction of the Sapahi mica mines in the Nawada district.

The special Rs. 6.55 crore smokeless fuel plant formulated by the Central Mine Planning and Design Institute (CMPDI) to be located at Ramgarh in Hazaribagh district, is yet another project approved by the standing committee of the Govern ment and awaiting Cabinet approva

BSMIC has decided to undertal some new projects including a spor ge iron project in Singhbhum distri by product recovery and coke plan in Hazaribagh district, mineral an lysis laboratory in Palamu distr and reorganisation of the Easte Minerals and Manganese Mines.

Mr. Jha said new mica mines ha been opened at Hanumanti, Pa watia and Bindeshwaria in Nawa district. These mines are expect to produce 85,000 kg. of mica I annum having a value of appro mately Rs. 15.77 lakhs.

Feldspar mining has been star in the mica belt which is utili for glass and ceramic industries.

The Corporation has increased business with public sector und takings by supplying limestone the Bokaro steel plant, limest dust to the Eastern Coalfields k nite to the Bharat Refractories, ca to MITCO and magnetite to BC and CCL.

A limestone grinding unit set up at Daltonganj with a cap ty of 750 tonnes per month on th shift working, with a view to me ing the requirements of the mines and also of the Agricult Department of Bihar.

Cochin refineries plans Rs. 100-cr. expansion

Cochin Refineries plans to expand its capacity by an additional 1.5 million tonnes at a marginal cost of about Rs. 100 crores.

The expansion will bring the total refining capacity of the refinery to six million tonnes per year.

The expansion scheme, including augmentinng the secondary processing facilities is now awaiting Government clearance, according to Mr. J. Jayaraman, Chairman and Managing Director of Cochin Refineries Ltd. (CRL).

He told a party of visiting newsmen from Delhi that the expansion scheme could be completed within three years after the Government approval.

Cochin Refineries in the joint sector is one of the oldest and versatile refineries in the country. It has processed 33 different types of crude, including imported and Bombay High.

The company could finance the expansion programme from its own internal resources.

Mr. Jayaraman said some of the other diversification programmes envisaged in the Eighth Plan include setting up of gas cracker unit, aromatics complex and lube refining unit. The company could also set up a grassroot refinery with matching secondary processing facilities at some location outside Kerala.

The expansion of coastal refineries like Cochin at a marginal cost is more economical than setting up grassroot refineries at prohibitive costs, according to oil industry sources. Moreover, the southern region, which is now marginally surplus in the supply of major petroleum products, will become a deficit area by 1994-95, according to the current trends in consumption.

The deficit of major petroleum products in the southern region is estimated to be more than one million tonnes by 1994-95 and over five million tonnes by the end of the century, according to official estimates. The sourthern region's requirements of petroleum products are now being met by production from Madras, Visakhapatnam and Cochin refineries.

Meanwhile, Cochin Refineries' diversification scheme, including the benzene project costing about Rs. 76 crores, is progressing on schedule. The project to produce 87,200 tonnes of benzene is expected to be commissioned by early next year. The refinery is also creating additional storage tanks for crude oil and LPG within the next two years.

Mr. Jayaraman said the company has also secured necessary clearances for setting up a captive power plant of 20 mw. The project is expected to be completed by the end of 1991.

The captive power plant will make the refinery self-sufficient in power requirements. It will also insulate the refinery from the erratic power supply from the Kerala State Electricity Board, thereby avoiding loss of production and safety risk operations.

Philips Petroleum of the US currently holds about 18.5 per cent of the paid-up capital of Rs. 10 crores of CRL. The US company is now planning to sell its equity shares at market value. It is expected to finalise sale of its shares after the necessary Reserve Bank approval in the next two months.

During 1987-88, the refinery processed 4.11 million tonnes of Bombay High and imported crude as against the annual target of 4.09 million tonnes. It is expected to process 4.5 million tonnes of crude in the current financial year. With better capacity utilisation, the refinery's turnover in 1987-88 is estimated at Rs. 1.030 crores.

The company is expected declare a dividend of 12 per cent for 1987-88, the same as the previous year.

A crude distillation unit is being set up with a capital outlay of Rs. 9 crores, as part of the research and development effort. It will be used to generate hydraulic and thermodynamic data on complex system distillation and to evaluate new designs of distillation tower internals to be used in the industry.

The safety control measures are being implemented in three phases at an overall cost of Rs. 10 crores.

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KARNATAKA, KERALA OFFSHORE OIL BLOCKS

Government signs contract with Shell

The government and the Oil and Natural Gas Commission (ONGC) signed two separate contracts with Shell India Production Development B.V. Netherlands, a Shell group company, for exploration and exploitation of hydrocarbons. The contracts pertain to two offshore blocks off the Karnataka and Kerala coast.

The blocks in the Arabian sea-KK-OS-II and KK-IS-IV-cover an area of about 49,000 sq. kms. The Shell group of companies is engaged in oil and gas exploration and production activities in more than 45 countries in different parts of the world, according to an official release.

The contracts were signed by Mr. S. Varadan, secretary, ministry of petroleum and natural gas. on behalf of the government, Mr. P.K. Chanraj, member, exploration. ONGC, on behalf of the commission and Mr. P.L. Folmer, director, Shell India Production, Development BV on behalf of Shell.

Under the contracts, the entire exploration risk will be borne by Shell which will take up seismic surveys and drilling work according to a phased programme. In case no petroleum is discovered Shell will have the option to terminate the contracts. All data acquired by Shell from its exploratory efforts in these blocks, will be made available to ONGC.

If petroleum is discovered in commercial quantities, ONGC will have the option to participate in the discovery to the extent of 40 per cent and receive a corresponding share of petroleum.

Shell is also required to share crude oil with the government after it recovers its costs. The sharing will be on a sliding scale. The company will share a higher proportion of the crude oil with the government as the economics of the project improves.

Shell's entire share of crude oil produced from these blocks will be available to the government at international market price till India reaches the level of self-sufficiency.

The contracts also provide for the government to enter into separate agreements on transfer of technology. ONGC personnel would be associated with the activities in the contracted blocks to give them exposure to exploration techniques used by Shell.

With the signing of these contracts with Shell, the Union government has finalised exploration contracts for eight offshore blocks covering an area of about 1,20,000 sq kms.

Meanwhile, work for acquiring seismic data in the four blocks, contracts for which were signed in December, 1987, has been completed by the respective foreign oil companies

ONGC cuts drilling costs

With the introduction of innovative drilling operations, the Oil and Natural Gas Commission (ONGC) has achieved a major breakthrough in its attempt to control operational costs.

These measures include dragging the rigs, modification of the rig mast, leap frogging, cluster drilling onland, induction of mobile rigs, induction of desert worthy rigs, measurement while drilling technology and computer aided drilling, according to ONGC sources.

These innovative measures were introduced in view of the several fold increase in drilling operations by ONGC during the Seventh Plan as compared to the previous plan.

As against 827 wells drilled in the Sixth Plan, about 2,000 are planned to be drilled in the current plan and the growth in metreage during the Seventh Plan is envisaged to be 151 per cent as compared to the Sixth Plan, the sources said.

There has also been an increase in the rigs with 25 being added in the Sixth Plan while 86 additional rigs are to be deployed during the Seventh Plan bringing the total number of rig count to 152 by 1989-90. At present ONGC is operating 120 rigs (93 onland and 27 offshore), according to ONGC sources.

It is estimated that domestic industry is presently supplying more than 50 per cent of the oil sector's requirement of equipment and materials like rigs, offshore supply vessels, casing pipes, oil field chemicals and cement.

Due to the emphasis by ONGC towards indigenisation, the percentage of rigs manufactured indigenously has shown upward trend.

As against a meagre 2 onland rigs in 1980-81, at present 34 out of an onland fleet of 93 rigs have been supplied by BHEL while HSL has so far manufactured only one offshore rig and two offshore are being manufactured by Mazagon Dock Limited (MDL) and would be delivered shortly, the sources said.

MDL has so far manufactured 3 offshore platforms for ONGC while Indian shipyards have also manufactured 18 offshore supply vessel for ONGC.

With emphasis on innovative drilling operations and encouragement to indegenisation, ONGC has been able to save foreign exchange to the tune of Rs. 2,907.08 crores during 1986-87 and over Rs. 3,000 crores in 1987-88, the sources said.

Another significant development has been the introduction of participation of indigenous industry in ONGC's activities in the area of drilling, seismic data acquisition and mud logging services.

ONGC STRIKES GAS AT SILCHAR

Oil and Natural Gas Commission (ONGC) has struck gas at Adamtila structure, about 60 kms west of Silchar in Karimgunge District of Assam, according to ONGC sources. The well drilled down to a depth of 3043 metres is releasing gas at the rate of 1.1 lakh cubic metres per day. Further testing is in progress. The discovery opens up a new lead for exploration in the highly prospective Cachar fold belt in Assam, the sources add.

The prognosticated resources in this belt covering an area of 7 sq. kms are estimated at 460 m of oil and oil equivalent of gas.

ONGC has identified 26 structures for drilling in the Cachar fold belt. Exploratory drilling has so far been carried out at Badarpur, Kanchanpur and Cahrgolla besides Adamtila.

Company Notes

INDIA GLYCOLS

India Glycols Ltd., promoted by Vam Organic Chemicals, is setting up a Rs. 87.50-crore project for the manufacture of a vital perochemical — monoethylene glycol (MEG) in technical collaboration with Scientific Design Company Inc., US at Kashipur, Nainital district of Uttar Pradesh.

The project is progressing and the company has already committed over 80 per cent of the total expenses. Main imported and indigenous equipment has already arrived at the site and is under erection. The company expects to commence production during the last quarter of 1988.

To part finance the project cost, India Glycols is entering the capital market on July 11 with a public issue of 135.30 lakh equity shares of Rs. 10 each at par aggregating Rs. 13.53 crores.

For manufacturing MEG, ethylene is derived from ethanol and then converted into MEG and end-products. Vam Organic is presently engaged in the conversion of molasses into ethanol as an intermediate for its end-products. The advice of Vam on the process knowhow and basic engineering for this process is being made available to the company at free of cost.

For further conversion of ethanol into MEG, India Glycols has entered into a technical collaboration agreement, with an US firm which has over 40 years of experience.

MEG is an insubstitutable raw material for the manufacture of polyester (staple fibre, filament yarn, films, chips and resins). For every tonne of polyester, more than one-third in quantity of MEG must be used (alongwith appropriate quantity of either DMT or PTA).

MEG is also used in brake fluids, dehydrants, coolants, explosives, paints, etc. The demand for MEG, which is currently estimated at 75,000 tonnes is expected to go up to 1.20 lakh tonnes by 1989-90 and three lakh tonnes in 1994-95.

The location of the plant offers advantages as the project is situated right in the heart of sugar belt of the country ensuring adequate and continuous supply of the main raw material — molasses. In addition, the bulk users of MEG are also located in close proximity of the project site.

India Glycols is the only company to have been licensed to manufacture MEG.

ABBOTT LABORATORIES

The directors of Abbott Laboratories (India) state in their annual report for the year ended November, 1987 that the new drug policy and drugs (prices control) order, 1987 are expected to have a favourable impact on the company's operations, if implemented by the government expeditiously. For the first time since the introduction of price control in 1970, some of the company's products have been decontrolled.

All its major products, including erythrocin and multivitamin formulations fall in category-2 and are eligible for 100 per cent maximum allowable post-manufacturing expenses. The company is awaiting government's ap-

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proval to its price applications. However, an additional burden will have to be borne due to increased trade discounts and cost escalation of bulk vitamins which are also decontrolled from pricing. Under the government's delicensing scheme, the company has commenced manufacturing bulk erythromycin ethyl succinate at its Ankleshwar plant.

During the year ended November, 1987, sales amounted to Rs. 20.85 crores against Rs. 19.22 crores. The working has resulted in a loss of Rs. 19.88 lakh against a loss of Rs. 102.85 lakhs in the previous year, after providing Rs. 25.37 lakhs (Rs. 26.89 lakhs) for depreciation. After adjustments, there is a debit balance of Rs. 62.07 lakhs, which has been carried forward. The equity dividend has been passed over.

The adverse working was attributed to the suspension of manufacturing activities at the Kurla plant during the year, which have since been resumed from March 21, 1988, after obtaining individual undertakings from workmen for normal production.

ZUARI AGRO

Zuari Agro Chemicals has submitted to the government its contract signed with Snamprogetti for the supply of knowhow and other services to Aravali Fertilisers Ltd., a company promoted by Zuari Agro, for approval.

While a no-objeciton certificate from the government of Rajasthan has already been obained to put up the project near Sawai Madhopur at the site approved by the government, final clearance from the ministry of environment is awaited.

Consent has also been received from the Controller of Capital Issues for raising the capital required for the project. The company's proposal to acquire a phosphoric acid carrier has been approved by the government.

There has been some delay in the implementation of its cement project in view of the government's decision to give priority to modernisation and expansion of existing units vis-a-vis new grassroot plants. The letter of intent issued by the government has been extended until Decemmer 31, 1988 and the matter is being pursued with the government at various levels.

ATUL TO SET UP 3 PROJECTS

Atul Products Ltd. has proposed to set up three new projects at a cost of Rs. 51 crores, said Mr. Sidharth Kasturbhai Lalbhai, Chairman of the company in Ahmedabad on May 30.

Addressing the Annual General Meeting of the company, he said that it was planned to set up a polycarbon project for manufacturing engineering plastics which would cost Rs. 45 crores. Letter of intent has already been received and negotiations for collaboration were in progress.

Wood plast panels and Agro chemicals projects, each costing Rs. 3 crores would also be set up. Separate companies for each such project would be set up, he added.

Mr. Lalbhai disclosed that the working of the Atul Products during the current year was satisfactory. Total sales went up to Rs. 40.59 crores during first four months of the cur-

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rent year as against Rs. 31.31 crores in the corresponding period of the previous year. According to him, total sales during the whole of current year would be higher by 25 per cent as compared to the previous year.

The chairman informed that the company has planned to spend a sizeable amount of Rs. 8 crores on expansion during the current year which will help in increasing the turnover. Under the expansion programme, it was decided to undertake production of T acid, new sulphur dyes, and expansion of disperse dyes.

He made it clear that the company was not facing any problem of power cuts as it had made its own arrangement. He also pointed out that it would be cheaper to use captive power instead of taking energy from the Gujarat Electricity Board because the power tariff had been increased by the GEB to a great extent.

HFC TO MARKET PPL PRODUCTS

Paradeep Phosphates Limited (PPL) has entered into an arrangement with Hindustan Fertiliser Corporation (HFC) whereby HFC will use its marketing network in West Bengal, Bihar and Orissa to push products of PPL in these states. PPL will pay service charges to HFC at the rate of Rs. 40 per tonne. PPL being a new company is yet to develop a sound marketing network. HFC, with its good network in eastern states, will be of help to PPL, it is felt.

HFC also benefits in the process. Imports having been suspended, HFC, the producer of nitrogenous fertilisers only, finds its source of phosphatic fertiliser dried up at a time when the offer of nitrogen with the back-up support of phosphate is considered the ideal package. The absence of such a package creates problems in fertiliser marketing. The tie-up with PPL is expected to help HFC overcome its deficiency in phosphate.

For the current kharif season, PPL, as per the allocation made by the Union government, has been asked to supply, iron terms of nutrients, about 18,000 tonnes of phosphatic fertilisers to West Bengal, about 14,000 tonnes to Bihar and about 15,000 tonnes to Orissa. However, it is not yet known how much of these allocations PPL will offer to HFC for sale. PPL will try to push the bulk of the allocations through its own net work.

It might be recalled that HFC sold about 4,000 tonnes of PPL products in the last rabi season on an experimental basis. However, the terms at that time were different. HFC got from PPL Rs. 55 per tonne for rendering the service — Rs. 30 per tonne as service charge and another Rs. 25 per tonne for promotional activity. This time the service charge has been raised to Rs. 40 per tonne while PPL has decided to take care of the promotional part itself.

The other companies which have been asked to supply phosphatic fertilisers in the current kharif season are Hindustan Lever 7,000 tonnes (W. Bengal) and 7,000 tonnes (Bihar), Iffco (Kandla) 13,000 tonnes (W. Bengal), and 9,000 tonnes (Bihar), Phosphate Company 5,000 tonnes (W. Bengal) and 1,000 tonnes (Bihar), Jaya Shree Tea and Industries 6,000 tonnes (W. Bengal) and 2,000 tonnes (Bihar) and RCF (Trombay) 2,000 tonnes (W.

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Bengal) and 3,000 tonnes (Bihar).

DEEPAK FERTILISERS MAINTAINS DIVIDEND

The directors of Deepak Fertilisers and Petrochemicals Corporation Ltd. have proposed to maintain the equity dividend at 15 per cent per annum, with the recommendation of 18.75 per cent dividend for 15 month period ended March 31, 1988.

The company's results have been adversely affected mainly due to reduced offtake of its products by two major consumers during the period July to December 1987. The situation has however improved during the current year from January-March, when the plant again operated at over 100 per cent capacity.

During the 15 month period under review, on a turnover of Rs. 48.57 crores (Rs. 41.32 crores for previous 12 months) the company has earned a gross profit of Rs. 13.57 crores (Rs. 13.38 crores). After providing Rs. 8.18 crores (Rs. 6.81 crores) for depreciation and Rs. 84 lakhs under section 115J (nil), and after adjustments, the net profit declined to Rs. 4.49 crores (Rs. 5.90 crores) after plough back, a sum of Rs. 9.53 crores (Rs. 7.95 crores) is available for appropriations.

The proposed dividend claims a higher amount of Rs. 2.49 crores (Rs. 1.73 crores) in view of increased capital arising out of the conversion of a portion of institutional rupee loans into equity. Its equity capital now stands at Rs. 14.83 crores (Rs. 11.50 crores).

Though the government has now fixed the uniform gas price the company is awaited the fixation of the final retention price for ammonia.

The company is going ahead with its diversification programme costing Rs. 170 crores, which is likely to be completed by end 1990. The diversification programme is intended to produce methanol, dilute nitric acid, concentrated nitric acid, low density prilled ammonium nitrate etc.

HINDUSTAN CIBA-GEIGY

Hindustan Ciba-Geigy Ltd has obtained a licence for the manufacture of hardeners for EPN resins recently. These would be manufactured at the existing EPN plant of the company.

Speaking at the annual meeting of the company in Bombay recently, chairman M.N. Karani said the production of hardeners was expected to boost the sales of resins. The sadles of plastics and additives division had already grown by 17 per cent in 1987 over the previous year.

Domestic sales of pharmaceutical products of the company had also increased by 18 per cent in 1987 over the previous year. The major thrust of pharmaceutical division in the future would be to achieve planned volume growth through increased productivity, obtain optimal prices for controlled products and streamline the operations.

Speaking about the current year's working, Mr. Karani said during the first five months of the current year, the turnover increased by 15 per cent over the corresponding period of the previous year. Profits also recorded some improvement.

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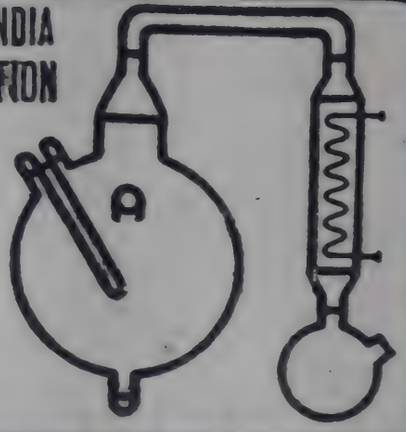

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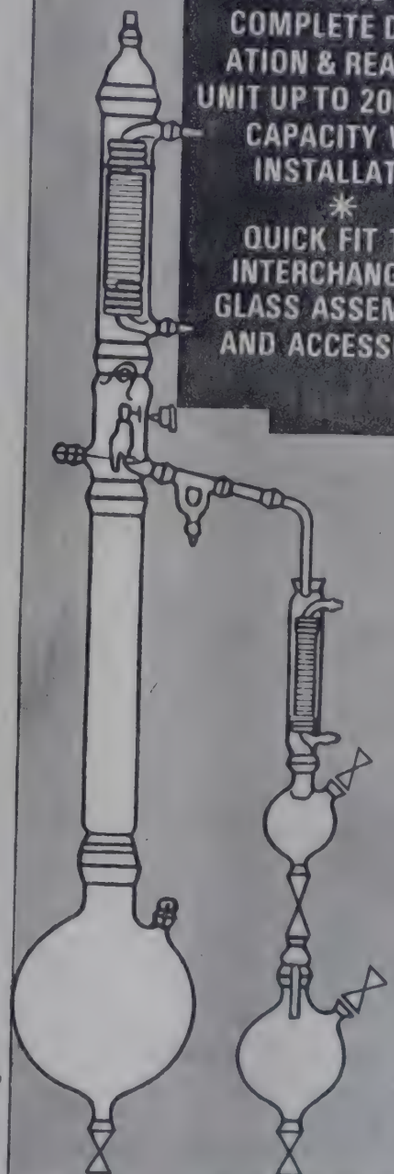

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SPOTLIGHT ON

Biotechnology & Life Sciences (Part 1)

JAPANESE RESEARCHERS PLAN FOR INCREASED BEEF PRODUCTION VIA ARTIFICIAL INSEMINATION

Researchers at the National Institute of Animal Industries are struggling with confidence towards increasing beef production in Japan via artificial insemination. They have recently succeeded for the first time in having cows bear triplets by means of artificial insemination. The cows are one black Japanese cow and two hybrids between black Japanese cows and Holsteins.

It has been rare to impregnate a cow by means of implantation of a fertilized egg. In the latest attempt all three cases of such implantation have been successful. This success is considered to pave the way for having cows bear more than two offsprings at a single birth.

Based on this success, the Ministry of Agriculture & Fisheries has founded a 5 year programme beginning April 1988, for development of techniques for producing beef on the basis of prolific reproduction by means of artificial insemination in a bid to reduce beef production costs.

With the latest method, eggs which has not been matured were taken from among eggs of both black Japanese cows and Hosteins which had been bred at stock farm, were matured in-vitro and went into in-vitro fertilization with spermatozoa of the black Japanese cow. Then the fertilized eggs were cultivated in the oviducts of rabbits and were implanted at an appropriate time into the wombs of the above mentioned three cows. (*Japan Chem. Wk.*, 1/28/88, p. 5).

NORMAL FLESH PIGMENTATION IN TANK-BRED SALMON AND SHRIMP PRODUCED BY DIETARY SUPPLEMENT BASED ON GENETICALLY ENGINEERED YEAST

Igene Biotechnology Inc. and New York Aquarium recently announced an aquaculture research accord to begin testing a new all natural dietary supplement that produces normal flesh pigmentation in salmon and shrimp. The dietary supplement based on a genetically selected yeast strain developed by Igene, contains the pigment astaxanthin, which is responsible for the natural pinkish colouration of salmon and shrimp.

The research due to be completed shortly, will establish optimum yeast supplement levels required to produce tank-bred marine species that are qualitatively equal to the native species in terms of tastes and appearance.

The high cost of achieving normal flesh pigmentation has been a major economic stumbling block to commercial cultivation of tank-bred salmon and shrimp. The ability to obtain natural colouration safely and at a reasonable cost could spawn major growth in domestic tank-farm production of these premium-priced seafoods. Such a success will imperil the export of shrimp from India and other developing countries to USA and W. Europe.

The Igene-developed yeast will be tested on geneticaly defined fish to evaluate the deposition of astaxanthin from yeast to fish. The researchers will be determining not only whether pigment containing yeast cells contained in standard diets can find expression in fish flesh, but they also hope to evaluate the effects of other nutrients in the yeast cells on the growth rates and characteristics of the fish.

So far, tank on aquarium farming has worked well for bass, catfish and some other fish species. But pigmentation problem exist for salmon, shrimp and other fish like trout and red seabream, which lack the genes to produce enzymes that synthesize carotenoid pigments from precursors in algae or convert carotenoid into needed astaxanthin. (*Biotech Progress*, 9/1987, p. 5-6).

DIAGNOSTIC KITS BASED ON MABs FOR A PLANT FUNGAL DISEASE ON THE HORIZON

DNA Plant Technology Corporation, Mount Kisco, New York, recently announced that Agro-Diagnostics Associates, its joint-venture with Koppers Co., has commenced the commercial production of a line of diagnostic kits for detection of fungal diseases affecting turf grass. The kits which make use of monoclonal and polyclonal antibodies -- based reagents, are being marketed to golf course superintendants in Northern New Jersey, Southern New York and other areas.

This represents the first commercial use of disease specific Monoclonal Antibodies (MABs), a technology used in the medical field for several years, for the detection of plant fungal diseases.

The Turf Grass Disease Detection Kits enable same day on site detection of Phthium Blight, Dollar Spot or Brown Patch, three highly destructive fungal diseases, before visible symptoms appear.

Detection of plant diseases is often a time consuming, costly process, typically involving delivery of a sample of apparently infected material to a plant technology laboratory. These easy-to-use kits bring the lab to the lawn, providing fast and reliable results. (*Biotech Progress,* 9/1987, p. S-4).

AN UPDATE ON JAPANESE R & D IN BIOTECHNOLOGY

Japanese firms have almost doubled their R& D efforts in biotechnology since the start of the present decade, according to the Japanese Bioindustry Development Centre. The average budget jumped from $2.7 million (350 million yens) in 1981 to 650 million yens in 1987. Similarly, the number of researchers in the discipline employed by the firms rose by 40% over the same period. (*ECN,* 2/22/88, p. 24).

RADIOPROTECTORS MAY PROTECT PATIETNS FROM CANCER CAUSED BY CHEMOTHERAPY & RADIATION

Radioprotectors were first detected in the late 1940s, but their potential role in cancer therapy was not realized until recently.

Biologists at the Argonne National Laboratory have found that certain compounds called radio-protectors, may protect cancer patients against later cancers caused by the drugs used to treat the disease. Argonne research group is exploring how the chemicals protect cells against the painful effects of radiation and chemotherapy. To do this they examined the effectiveness of a radioprotector dubbed WR1065 against three common chemotherapy drugs -- bleomycin, nitrogen mustard, and cis-platinum -- in Chinese hamster cells.

Cells exposed to cis-platinum were seven times as resistant to mutation if they also were treated with radioprotector, the Argonne researchers reported. In the cell, radioprotector may prevent mutations by increasing the cell-cycle time (the period between cell divisions) and limiting the damage caused by free radicals (atoms with an extra electron). Lengthening the cell's cycle time would allow it more time to repair damage from toxic chemicals. Improving the accuracy of repair lessens the chance that a mutation will be passed on to daughter cells. (*Biotech Progress,* 6/1987, p. J4).

A REPORT 'BIOTECHNOLOGY IN JAPAN' PUBLISHED BY SERC'S BIOTECHNOLOGY DIRECTORATE, UK

A recommendation that more British biotechnologists should visit Japan as it would lead to advantageous scientific collaboration and also provide the basis for wider commercial contacts is made in a recent report by a group of UK biologists pubished by the SERC after a visit to Japan during April 1987.

The British group visited a range of research laboratories; many in the field of protein engineering and plant molecular biology. The group found that the research in many of the laboratories was of a very high standard. It noted that while there were frequent visits of Japanese scientists to the UK, the reverse was not true.

Japanese scientists were enthusiastic to collaborate with tne UK, because of the UK's good track record of achievements in fundamental science -- also to improve their English.

Copies of the Report 'Biotechnology in Japan' are available from the SERC's Biotechnology Directorate, UK. (*The Chemical Engineer,* 10/1987, p. 8).

TISSUE-CULTURE TECHNIQUES PROVIDE 'SUPERTREES' FOR REAFFORSTATION

Australia's fauna is among the toughest in the world and the 'supertrees' developed in Australia via tissue culture are now going overseas. These trees are among the toughest of the tough and possess extraordinary capabilities such as salt-tolerance, drought-resistance, resistance to water-logging, high rates of water transpiration and high growth rates.

A trial batch of salt-tolerant Red River Gums is already growing in Kuwait. Middle Eastern countries need extensive landscaping programmes around population centres, but there is hardly any rains and the little fresh water available is used for drinking. The only water available for plants is saline, so salt and drought-resistant trees are in great demand.

These supertrees have been developed by collecting seeds from the healthiest trees growing in the harshest-conditions throughout Australia, such as around salt lakes and along estuaries. Germinated and grown in glass houses, the trees are subjected to increasingly severe conditions until only a few survive. Using tissue culture techniques these survivors are then cloned for further trials and commercial mass propagation. Culturing and cloning ensure that each sample is genetically identical and so carries the denied characteristics of the paren

plant. Selling the cloned saplings also eliminates the long wait for the trees to produce seeds.

Scientists from several universities and research laboratories are involved in the programme including the mining company Alcoa, whose interest arises from its commitment to the reafforestation of mine sites. According to Dr. Victor Harvey of the Commonwealth Scientific & Industrial Research Organization's (CSIRO) Division of Forest Research, tolerance to water with salt concentration up to twice that of seawater have been achieved.

Scientists are also working on further improvements to the performance of the trees by inventating them with specific plant-root fungi (ectomycorrizas) that live in a symbiotic relationship with the trees and can enhance their ability to resist environmental stresses such as salinity and improve their ability to take up nutrients from the soil, leading to faster growth.

The latest wave of Australian migrants will include various species such as the Wattle (Acacia) and the Australian She-Oak (Allocasuarina) as well as the common eucalypt. This programme should answer the criticism often levelled at the eucalypt by farmers in the developing countries that their foliage cannot be used as animal fodder. The fast growing trees will be valuable to many of the developing countries as sources of firewood, for reafforestation and for the production of pulp wood. (*Nature,* 6/11/87, p. 452).

INCREASING ROLE FOR ENZYMES IN ORGANIC AND BIO-ORGANIC SYNTHESIS FORESEEN

Enzymes are commonly thought to be too exotic and expensive to be applied to any large-scale synthesis of organic and bio-organic reactions. Although this is true, enzymes are increasingly being used in the synthesis of specialty pharmaceuticals, food chemicals and agricultural chemicals.

Use of enzymes in detergent formulations is extensive. Similarly, the Novo process for the production of insulin can be termed as a biotech process, because it employs enzymes. A recent article in *Chemistry in Britain* (1987, 23, 645-54) provides an interesting summary as well as promising portrayal of the numerous possibilities in organic and bio-organic synthesis.

Because of the enzymes high regio-selective and stereo-selective capabilities, and because of their acceptability with regard environmental considerations, greater usage of enzymes can be expected in the future. (Whitesides, G.M., **et. al.,** *Chem. Brit.,* 1987, 23, 645-54).

MICROBIAL-ORIGIN CHYMOSIN ENZYME DEVELOPED

The first food-additive petition involving a fermentation process using a genetically engineered microorganism has been accepted for filing by FDA in USA. This petition submitted by Pfizer covers the milk-clotting enzyme Chymosin.

The mammalian enzyme Chymosin is the active component of calf rennet which has long been recognized as the premier milk coagulant used in the manufacture of high quality cheese. Calf rennet is traditionally obtained by extraction from calf stomachs, which fluctuate in availability and price. With phenomenal increase in cheese production worldwide, calf rennet is often in short supply.

The new fermentation process developed by Pfizer will provide a steady supply of the Chymosin enzyme economically in a consistent stable and highly pure form. This is a new landmark in cheese production technology. According to the company, Chymosin produced by fermentation is identical in all respects to that obtained from calf stomach. Its efficacy in cheese making has been demonstrated repeatedly at plant scale.

Development of Chymosin involved development of a commercially practical fermentation process and production of the 'nature identical' prochymosin gene a major feat because of its compexity. Recombinant-DNA techniques were then used to insert the prochymosin gene into a host microorganism, used in the fermentation process. The microorganism is not present in the final chymosin product.

Pfizer will manufacture Chymosin under the appropriate NIH guidelines for r-DNA research in a new facility under construction at Terre Haute, Indiana. The milk-clotting enzyme (Chymosin) will be marketed worldwide by Pfizer's Dairy Products Group headquartered in Milwaukee, Wisconsin. (*CMR, 12/7/87, p. 9).*

BIOLUMINESCENCE -- NEW POWERFUL TOOOL FOR BIOASSAYS & DETECTION OF TOXINS

Bioluminescence -- the emission of light by living organisms -- is a widespread phenomenon, particularly among the marine organisms. Almost 90% of the species in the ocean's 'midwater' environment (between surface water and deep water) emit light. Now industry researchers are harnessing the phenomenon to illuminate endeavours ranging from development of new bioassays, diagnostic tests for toxins and anti-cancer agents

Underlying light production in all bioluminescent organisms are similar biochemical mechanisms. The organisms use energy to excite molecules known as luciferins. The excited state is unstable, and luciferin eventually decays into a variety of proucts including light -- catalyzed by enzymes known as luciferases. And because bioluminescence is chemically generated, it does not generate heat.

It is that innocuous production of light, moreover, that makes bioluminescence attractive. Unlike radioactivity, which enjoys widespread use in clinical assays, bioluminescence used as a detection tool presents no toxicity or storage problems. Nor does it raise environmental questions.

A luminescent assay developed from firefly is currently the clinical assay of choice to measure adenosine triphosphate (ATP), the central energy compound of all living organisms.

A broad-spectrum luminescent test that is gaining acceptance for toxin detection uses the marine bacterium *photobacterium phosphoreum* to detect toxins such as mercury, lead, polychlorinated biphenyls (PCBs) and phenols. This test is both sensitive and economical as is the case with all diagnostic tests based on bioluminescence. Another example is the simple assay for toxic waste developed by Microbics of USA. The assay trade named Microtox is based on a strain of *P. phosphoreum.* In this assay, the above bioluminescent organism is challenged by a liquid sample (of toxin), luminescence then decreases in proportion to toxicity of the sample, since toxicity effects bacteria's rate of energy production. In this way the toxicity of the sample can be monitored by precisely measuring the luminescence.

Lederle Laboratories (USA) is using luminescence for different purposes. It is employing luminescence as a prescreening method for cancer drugs. Lederle's researchers have found that anti-cancer agents bind to the DNA of dark variants of the luminescent marine bacterium *photobacterium leignathi.* For reasons that are not now understood, the binding causes the bacteria to light up. The researchers are using those variants to screen fermentation broths from soil microorganisms for potential anti-cancer antibiotics. The assay is rapid and requires only microgram quantities of broth.

Lederle researchers are end avouring to understand the mecha ism by which anti-canc compounds cause luminescence. has cloned the luminescent gen from *P. leignathi* into *E. coli* and h found that the anti-cancer age ethidium bromide causes rapid a reversible luminescence. But w the anti-cancer agent nalidixic ac a 'noticeable lag' occured befo luminescence. This suggests th the mechanisms whereby the tw drugs stimulate luminescence m differ. The luminescent genes in *coli* make it possible to take advan age of the many mutants and tec niques available in the *E. co* system for mechanistic stud (*Chem. Wk.*, 2/4/88, pp 25-26).

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* Italian Pharmaceuticals conc Bracco is looking to take contro local anaesthetics producer Sint ica, having acquired an 88% sta in the Swiss firm. Cost of the sta was not revealed. Bracco is repor to be eyeing further acquisitions b at home and abroad, particularly the radiological reagents sec where it already has 25% of world market. Bracco had sales L374bn (302m) last year, alm two-thirds from exports.

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ood & Pharmaceutical Technology in Perspective

JRIMI -- A PROTEIN OF THE JTURE

Surimi is the name of a new fish otein developed originally in Japan d now after being researched in irope and USA is claimed as a nuine revolution in food technol- y promising long-term benefits for e industry and the consumers it rves. In the last few years Surimi s exploded into a multi-million llar business with huge potential further development.

Once only eaten in Japan, Surimi a semi-processed, frozen, stabi- ed, washed fish protein used for aking "Kamaboko" and fish saus- e. To-day this odourless and steless material is used for the anufacture of a wide range of at-gelled and emulsified products cluding shellfish analogues such 'Ocean Stix'.

Considerable textural modification possible during gelling to form res, flakes, layers, moulded apes and so on. Flavours and col- rs can be added, the textured ms can be included in pastry pro- cts or enveloped in crumbs and tter coatings. They can also be ed and rehydrated.

In 1987, world Surimi production m a variety of fish species was timated to jump to between 0,000 to 400,000 tonnes. Most of s will be produced by Japan here the Japanese Fisheries sociation forecasts production of 0,000 to 250,000 tonnes, divided enly between at-sea and on-shore ocessing plants.

The first European laboratory pro- ss of Surimi was carried out at Bri- in's Torry Research Station, Scotland (UK) in 1977, which led to a pioneering pilot scale production exercise on blue whiting Surimi in 1978. Blue whiting is a cheap small cousin of the cod, and is available at certain times of the year in large quantities off the West coast of Scotland.

The range of experimental Surimi-based products presently being examined in North America, Europe and Scandinavia is staggering. It includes sauces, dips, spread, pates or pastes, hors d'oeuvres, salads, soups, chowders, noodles, aspics, burgers, fish balls, sausages, pies, hams, meat rolls or loaves and even desserts.

The conventional Surimi manufacturing process developed originally in Japan was essentially based on mechanisation of the traditional manual production methods. The mechanised process is after the intial heading, gutting, filleting and de-boning of the round fish, based on two or three stage washing, after which the water is strained off through large rotary screens. After refining the mince to remove residual black tissue, it is dehydrated in a screw press before final admixture of cryoprotectants and block freezing. The cryoprotectants are added to prevent denaturation. The amounts of cryoprotectants considered necessary vary from maker to maker. As a rough guideline for "Mu-en" salt-free Surimi, the sugar and sorbitol contents are each about 4% and polyphosphates 0.3%.

Based on the above basic process Alfa Laval (Sweden) has developed and improved proprietary modern process for Surimi called Alfa Laval Decanter process which gives a solid yield of 71%. (*Food Manuf.* 11/1987 pp. 48-49).

A COMPACT ASSEMBLY TO INJECT INERT NITROGEN INTO CANS & BOTTLES

Inert nitrogen can be easily injected into food product cans and bottles by a system called Linpulse. Small injections allow aluminium cans to be pressurized with nitrogen, so they are better protected against damage, while keeping contents fresh for an extended time. Bottles can be injected with nitrogen before or after filling. The added nitrogen replaces air keeping the bottle contents fresh longer.

The unit is designed to pressurize from 2-20 cans or bottles per sec. on the production line and includes a pump so that the amount of nitrogen can be adjusted to suit different packaging materials and desired pressures. For further information write to AGA Gas Inc., Corporate Headquarters, 625, Oaktree Blvd., Cleveland, OH 44137.

A NEW FRUCTOSE BIOPOLYMER ADDITIVE PATENTED BY IGENE BIOTECHNOLOGY, USA

Igene Biotechnology (Rockland, Maryland, USA) has recently received a patent approval for a fructose biopolymer additive designed as a thickening agent in soaps, shampoos, cosmetics and toiletries. Although the patent approval is for food uses, the company will focus on cosmetic market in the first phase. (*JAOCS*, 11/1987, P. 1555).

AN INTEGRATED BIOGAS/SPIRULINA SYSTEM DEVELOPED TO PROVIDE EDIBLE PROTEIN

An unique integrated biogas/Spirulina system developed by a Swiss

group Green Flamingo can provide a cheap source of protein as well as improve the quality of biogas.

In a biogas generator, organic material such as vegetable scraps, weed, manure etc. are fermented by bacteria in a task. This produces a sludge that can be used for fertilizer and so called biogas for heating and lighting. The fuel in the biogas is methane with 40% carbon dioxide. The presence of carbon dioxide makes the biogas flame red rather than blue and gives off soot polluting the atmosphere.

In the integrated system developed by the above Swiss group, the biogas produced is pased through water, where the carbon dioxide dissolves. The methane is then drawn off to burn cleanly with a blue flame. The carbon dioxide solution is in turn fed to blue green algae Spirulina (also called cyanobacteria). The solution would be too acid to feed to most microorganisms, but Spirulina tolerates such high level of alkalinity (upto pH 11), that the acidity of CO_2 solution makes little difference. It is reported that Spirulina can be grown under sunlight in troughs containing sea salt at one-fifth the strength of sea water, with phosphorus iron and nitrogen from the biogas fermenter residues.

This makes it possible to use biogas and Spirulina in an integrated system. The fermenter supplies carbon dioxide and nitrogen for the Spirulina, and methane for the village. The Spirulina provides food for people directly, or is fed to fish.

Spirulina provides quality protein and contains up to 70% protein dry weight. Its efficiency in turning raw input into protein is 25-times that of maize, and 300 times that of beef. For human nutrition, Spirulina's protein is equivalent to that of egg, being slightly deficient only in cystine and tryptophan. It contains little saturated fat, but all the essential fatty acids, including gamma linoleic acid, a scarce nutrient in many traditional diets. The algae contains Vit. A and B Complex, including Vi. B12, otherwise found only in animal sources.

Spirulina is grown commercially in USA, France and Japan to provide blue food-colouring, health foods and cosmetics. It is used to purify waste water in Israel, as an animal feed in India and is being studied as a way of producing oxygen on submarines and spaceships.

The algae have been extensively used as a food supplement for babies and nursing mothers. Nutrition experts are amazed at the ease with which babies digest the algae, which are primitive organisms without complex cell walls. Babies on the edge of starvation respond to Spirulina after they have ceased to respond to any other emergency food.

The Swiss group (Green Flamingo), has already set up three integrated biogas/Spirulina system under the trade name 'Flamingo One' in India, Togo and Peru. The group is keen on establishing its integrated systems in areas of the Sahel in West Africa that are becoming deserts.

The idea is to set up a green belt along water courses based on the humus added to the soil by the biogas fermenters and to save trees by substituting biogas fuel for wood. In the long term it could alter the climate and halt the advance of the desert.

The Chinese in particular, are impressed with the system. China, incidentally, is a world leader in biogas production with over 7 million biogas generators providing power in rural China. The Chinese are trying out the above integrated system on 300 biogas installations (*New Sci.*, 3/31/88, p. 32).

A BIOTECH PROCESS FOR ERYTHRITOL DEVELOPED IN JAPAN

National Food Research Institute and Nikken Chemicals Co. both of Japan have jointly pioneered production of erythritol (a sugar alcohol) from grape sugar by a biotech process employing a mutant yeast. In this new biotech process, erythritol is produced by fermenting grape sugar by means of using Aureobasidium SN-115 yeast. The researchers were able to produce 47 gms. of the product from 100 gms of grape sugar employing biotech method comprising filtration, refining, concentration and crystallization processes.

The yeast is a mutant capable of living under high osmotic pressure and producing erythritol without forming foams. It can be employed even in the case of highly concentrated (35%) grape sugar.

In nature, erythritol is contained in Lichens (content 0.3~0.5%), mushrooms (2~4%) and in Sake, wine and sherry. The percentage content being so low, it was not possible to extract erythritol from natural products commercially. Therefore application of erythritol to food products has not been possible so far.

A potential application of erythritol in diet as a sweetener is on the horizon. Erythritol is hardly metabolized within the human body and by enteric bacteria. It is less hygroscopic and has sweetness equivalent to 80% that of sucrose. These properties make it very useful as a no-calorie sweetener in obesity and for diabetics. Due to these advantages the product will be applied in production of table sugar, confec-

ionaries and other types of food and some chemical products.

Nikken Chemicals is planning to put the product on the market around 1990 after developing production facilities for this useful sugar alcohol. (*Japan Chem. Wk.*, 1/28/88, p. 5).

SOYBEAN WHEY-DERIVED OLIGOSACCHARIDE MAKES A DEBUT IN JAPAN AS A NEW SOYBEAN-BASED HEALTH FOOD

The Calpis Food Industry Co. has recently started trial sales both in Japan and abroad of lactic acid bacteria applied health food (trade name BIFIDUS) -- a combination of oligosaccharide obtained from soybean whey and lactobacillus bifidus living inside the intestines. This health food is based on the company's technology for producing high-purity oligosaccharide from soybean whey. Bifidus is the company's first product produced from soybean whey-derived oligosaccharide. The company's researchers feel that Bifidus will help people towards better nutrition in Japan as well as USA and Europe. (*Japan Chem. Wk.*, 3/12/88, pp. 4-5).

CARBON-DIOXIDE EXTRACTION SPAWNS A REVOLUTION IN ESSENTIAL OIL INDUSTRY

The World's Perfumery Conference held last February in New Orleans, USA surveyed the phenomenal progress in advanced countries of a wide variety of essential oils used in food, perfumery and pharmaceutical industries) produced by carbon dioxide extraction, which offers advantage of extraction at low temperatures. These oils, mainly of the spicy flavour type are designed to be free of alcohol residues and to provide a character closer to the botanicals due to low temperatures use in their manufacture.

Falton Worldwide Inc. (USA) the first company to offer these oils commercially presented its current line of 51 "Templar" (or CO_2 process) oils. Included in the line are 17 citrus oils, several ginger oils, vanilla oleoresin and juniperberry.

The Essential Oil Division of Pfizer Inc. (France) also presented at the Conference carbon-dioxide extracted oils. The company unveiled its future plans to erect a several million dollar plant for extraction of essential oil and perfumery oils by CO_2 extraction in France. (*CMR*, 2/15/88, p. 38).

THE FIRST COMMERCIAL FERMENTATION ROUTE FOR COMMERCIAL PRODUCTION OF AN EDIBLE OIL

The first commercial fermentation route for bulk production of an edible oil is claimed by J & E Sturge (Selby, UK), a subsidiary of RT2 Corporation. Sturge has invested more than $10 million in developing the new process for the oil called Oil of Javanicus. This oil is a good source of gamma linolenic acid (GLA), a fatty acid that is an essential nutrient and has wide applications in food health products and cosmetics.

In the process developed in conjunction with researchers at the University of Hull (UK), the oil is obtained by fermentation in a 220 tonnes deep-stirred reactor using the microorganism *Mucor javanicus* and glucose produced from wheat starch. The biomass is harvested in a rotary vacuum filler, extracted with a proprietary technique, and refined to edible oil standards.

Until now, the major source of GLA have been oils extracted from the seeds of the evening primrose, borage and black currents. Oil of Javanicus will sell for the same price ($72/kg) as the most widely used source, evening primrose, but have twice the GLA content (16%) of the latter. (*Chem. Eng.*, 3/28/88, p. 13).

A NON-CALORIC PROPYLENE-OXIDE-BASED FAT SUBSTITUTE ON THE HORIZON

A new non-caloric fat substitute that differs from Sunplesse and Olestra recently developed by Nutra Sweet (a subsidiary of Monsanto) and Procter & Gamble respectively. This new fat substitute was developed by Arco Technology researchers. Called ecterified propoxylated glycerol (EPG), it is made by modifying conventional oils: glycerin is first split from fatty acids, reacted with propylene oxide, and then attached to the fatty acids. The company's researchers believe that the modification keeps EPG from being metabolized by the body when used in such foods as ice cream, mayonnaise and cakes. The commercialization however may take 5-10 years since propylene oxide is used in its synthesis, making safe testing of EPG as a food additive take another 3-5 years. (*Chem. Eng.* 3/28/88, p. 17).

INTRA-NASAL INSULIN APPEARS EFFECTIVE & CONVENIENT

Intranasal administration of insulin appears very promising as an adjunct or possible alternative to insulin injections.

In treating Type I and Type II diabetes, inhaled insulin produced blood insulin levels that more closely resemble those of the normal pancreatic response to food. It may additionally alleviate the patient's need for very punctural meal schedule and decrease the number of low blood sugar reactions. The above conclusions were made after a six

months study of the clinical trials on patients with Type I and Type II patients at the Boston University Hospital in USA. (*Pharmacy Times*, 1/1988, p. 10).

A NEW FAT SUBSTITUTE SIMPLESSE

Nutrasweet Company, a subsidiary of Monsanto Chemical Co., unveiled in February 1988, the introduction of a new fat substitute. The new fat substitute is reported to cut calories consumed in fat by about 85%. The product is expected to be in the US market in 12 to 18 months.

Simplesse, according to company's researchers replaces calories and cholesterol by replacing fat with protein from egg whites or milk.

Products that the company expects to include the substitute in are ice cream, butter substitutes, cheese spreads, sour cream and dips as well as oil-based products like salad dressings and mayonnaise.

However, unlike butter, simplesse cannot be cooked. If one attempts to cook with it, the product will congeal or curdle, much like protein in an egg when it is fried.

If you put Simplesse on toast, it will spread like butter and melt like butter. It will not affect the taste of the food. In butter and ice cream, it will provide the creaminess to which the people are accustomed. In producing Simplesse the company employs a microparticulation process that shapes the protein into many miniscule round particles. The tongue feels them but the protein beads are so small that the tongue perceives them as creamy.

According to the Company, this fa substitute falls into category whic FDA recognizes as generally safe. I developing this new product th company has just changed the phys ical form of the proteins and n chemical change has occured.

Nutrasweet figures on the nev product indicate that four ounces c superpremium ice cream containin egg white protein have 130 calorie compared with the same ice crea with milk fat at 283 calories.

Salad dressings might conta whey proteins, reducing the calorie from 80 to 20 calories a tablespoo One gram of Simplesse is equivale to three grams of fat. In making ic cream, skim milk with one half pe cent milk fat will be used in comb nation with Simplesse, so traces milk fat would still be found. (*CM* 2/1/88, pp 5, 13).

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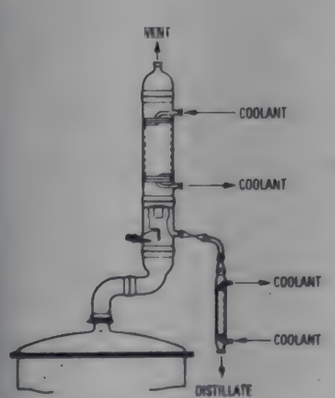

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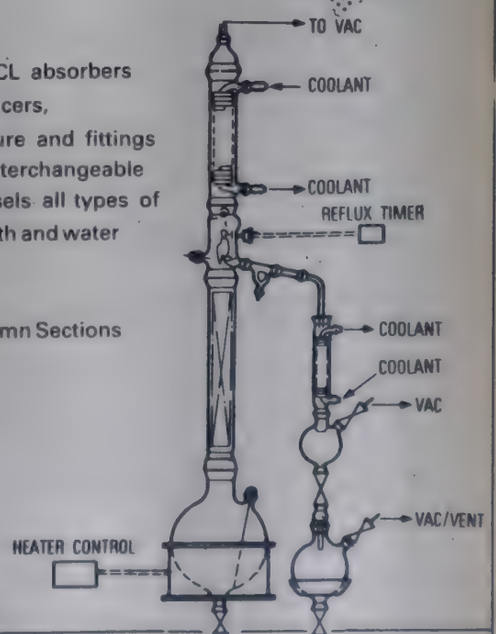

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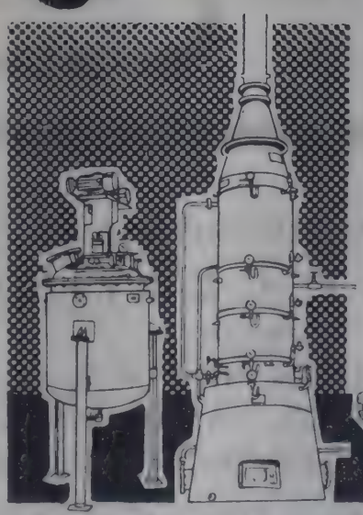

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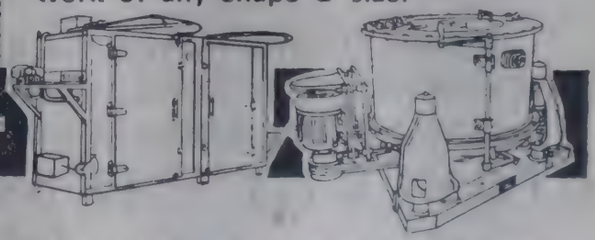

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Chemical News from Abroad

QUANTUM PLANS CRACKER IN $600m EXPANSION

Quantum Chemical has announced a major $600m expansion programme for its USI division which involves the construction of a 680,000 ton/year ethylene cracker at the company's Deer Park, Texas site.

There are also plans for a new 90,000 ton/year high density polyethylene facility, a 136,000 ton/year linear low density polyethylene plant, debottlenecking of existing ethylene and polypropylene capacity, plus a further expansion of 82,000 ton/year in PP.

According to Quantum chairman John Hoyt Stookey, the investment — which has received board approval — demonstrates the firm's "absolute commitment to its core businesses." Formerly National Distillers & Chemical Corp, the company has spent the last few years shedding, along with its name, a number of businesses while focusing its resources on building and consolidating its position in chemicals.

Quantum confirmed that it had chosen to build on its existing strengths rather than diversify into speciality products or grow through acquisitions.

Peter Spitz, a director of US consultant Chem Systems, comments that the industry has been expecting the announcement of one or two grassroots crackers Quantum, as the largest merchant buyer of ethylene in the US (purchasing around 900,000 ton/year) "seems the most logical company" to proceed with the construction of a new cracker, he adds.

The move marks Quantum's first direct step into backward integration, Spitz points out. But the timing of its decision to build a cracker seems right considering the company's strong financial position together with the increased supplies of feedstock that will be required to satisfy Quantum's plans for additional PE capacity.

The cracker will be the first new ethylene plant to be built in the US since the early 1980s, Quantum says, although Phillips Petroleum's plans for a 680,000 ton/year unit due for completion by end 1990 could overtake this.

Phillips is awaiting the results of a definitive cost estimate and design study. A final decision to go ahead with the cracker is due by the third quarter of this year, a company spokesman said, adding that "it looks pretty good" at the moment.

The Quantum facility is expected to come on stream early in 1991. M W Kellogg has been appointed engineering contractor on the project, expected to cost between $300-350m. The technology has not been confirmed but will be "state-of-the-art" and will involve the "lowest energy cost of ethylene per pound produced" a company spokesman said.

Contractors have not yet been appointed for the hdPE and lldPE plants or the PP expansion, but bids are currently under examination.

The ethylene supply situation in the US is tight and likely to remain so. Quantum's existing ethylene facilities, acquired when it bought Enron Chemical in 1986, have been operating "flat out". But companies have been reluctant to commit themselves to new building, fearing future overcapacity, demand downturn and the possibility of recession. However, a sustained period of strong demand and confidence in the chemical industry's buoyancy over the next couple of years at least, has encouraged a number of firms to consider demothballing existing units or building new plants.

Under its investment programme, Quantum will raise total ethylene capacity from just under 1m ton/year at present to around 1.86m ton/year. Modernization and debottlenecking of its plants at Clinton, Iowa and at Morris and Tuscola, Illinois, will up capacity at the three units by over 200,000 ton/year.

Its plans for polyethylene will lift total capacity by some 30 per cent to more than 2m ton/year. Scheduled for early 1990 start up, the new hdPE plant will be based on Quantum's proprietary gas-phase technology and will have the potential to switch to lldPE production. Construction at the swing plant is due to begin this summer at the company's Houston site.

Further increases to Quantum's hdPE capacity will result from its purchase of Amoco's Chocolate Bayou plant adding 180,000 ton/year to output.

In addition, debottlencking work at the company's Clinton and Houston facilities will boost capacity by 70,000 ton/year by the third quarter of 1989.

The $600m expansion programme which, according to Quantum, will be financed internally from cash flow, also involves the construction of a new 130,000 ton/year lldPE facility

based on the Unipol process at Morris, Illinois. The plant is expected to come on stream early in 1990. In addition, Quantum Chemicals's existing Unipol reactor will be debottlenecked, also taking capacity to 136,000 ton/year.

At the same site, the first phase of a multi-phase expansion and modernization programme — stemming from the technical agreement signed last year with BASF and ICI — will boost PP capacity to 136,000 ton/year by the fourth quarter of 1983. Additional phases will give the company a total capacity of over 200,000 ton/year by 1992.

MTM IN US FINE CHEMICALS DEAL

The UK speciality chemicals concern, MTM, has announced the takeover of Traybor, a South Carolina-based fine chemicals firm for $7.36m.

MTM's chief executive, Richard Lines, revealed that the acquisition formed part of the company's strategy to exploit the "very substantial possibilities which exist for expansion within the US." The agreement also includes the purchase of a 100-acre site of which only a small proportion contains Traybor's facilities.

MTM said that a major US chemicals company, which has not been named, would be supplied with agrochemical intermediates from a new plant which has been commissioned at the site.

Traybor's management will remain intact except for its chairman, who is retiring. MTM director Jim Friederichsen will become president.

DOW, SUMITOMO LINK IN JAPAN POLYCARBONATES DEAL

Dow and Sumitomo have joined forces to capitalize on growing demand for polycarbonate resins in Japan. Under the terms of a joint venture agreement, Dow will hold a 35 per cent stake in the Japanese company's subsidiary Sumitomo Naugatuck.

The company will initially import polycarbonates from Dow's US plant, but the venture plans to build a 20,000 ton/year plant in Japan by the early 1990s to meet its estimated share of the market. When this happens the two concerns will have an equal share in the venture.

Dow says the move will strengthen its global position and also enable Sumitomo to meet the needs of its customers. Currently, Dow claims a 4-5 per cent share of the 300,000 ton/year world polycarbonates market, standing third behind General Electric and Bayer's US subsidiary Mobay. By the late 1990s, Dow aims to expand its position with production facilities in all three major markets — US, Europe and Japan — and command a 20 per cent global market share.

Polycarbonate sales in Japan stand around 80,000 ton/year. Until now Dow's share of business there has been small. Four Japanese producers — Teijin, Mitsubishi Gas Chemical, Mitsubishi Chemical and Idemitsu — supply most of the domestic market which is predicted to grow by 10 per cent/year. Dow and Sumitomo are looking for a 10 per cent share of this market. Main end uses are in the electronics, automotive and construction industries.

According to Gerald Pearson, vice-president of Dow's plastics division, "Japan is one of the leaders in setting the design, specification and production of key products in end user industries all over the world. Sumitomo Naugatuck provides the best avenue to participate in this key area."

To support the Japanese programme, Dow's second US polycarbonates train will start up in Q3 of this year, giving total output at the Freeport, Texas-based plant of 45,000 ton/year. Elsewhere, Dow Chemical Europe recently announced plans for a 35,000 ton/year plant in Stade, West Germany, to start up in 1990.

When the Japanese polycarbonate plant is built, it will be supplied with Bisphenol-A raw material from the US. Dow has no plans for carrying out polycarbonates R&D in Japan, although in the future Sumitomo Naugatuck will develop some kinds of polycarbonate alloys. The company presently manufactures and markets ABS resins and AES weatherable polymers.

As well as distributing Dow's polycarbonate resins, it will make and sell the polycarbonate compounds and polycarbonate/styrenic alloys.

AMI SLAMS INCINERATION STUDIES

The Association of marine incinerators (AMI) has reacted angrily to greenpeace's latect attempt to get the burning of toxic chemicals at sea banned on a global scale. Last week the environmental pressure group submitted three independent studies conducted by the Studsvik institute and Hamburg university to the London dumping conven-

tion, the international body controlling ocean dumping. The studies linked marine incineration of toxics with "increased levels of poisons on the surface and the seabed of the North Sea."

AMI says the studies "lack the substance to withstand any critical scientific scrutiny." It also accuses Greenpeace and the Danish government of "consistently ignoring 19 years of completely safe, environmentally harmless operation and 21 research experiments carried out on the ships for scientists."

Responding to the allegations, Greenpeace toxic campaigner Beverley Thorpe claims her organization had identified the need for a strong scientific argument if it was to influence a global decision. According to Thorpe, the working group set up at the London meeting last week to discuss the issue found it did not have the scientific expertise to evaluate the new studies.

Last year's decision to ban marine incineration in the North Sea by 1994 has yet to be ratified by the Oslo commission. Greenpeace is concerned that if the ban is passed, the practice will be shipped to the third world.

A spokesperson for Ocean Combustion Services (OCS), which owns one of the two incineration vessels operating in the North Sea, agrees there will be a problem disposing of chlorinated hydrocarbons after 1994. At present around 110,000 ton/year is incinerated in the North Sea.

Alternative treatments, OCS claims, are currently only laboratory scale or can only deal with specific chemicals rather than a mixture. The company also warns the new processes will be more expensive citing prices of over £500/ton ($930/ton). Marine incineration costs £100/ton.

Greenpeace advocates cutting down the production of chlorinated hydrocarbon waste at source through recycling and substitution.

AKZO ACQUIRES STAUFFER AUSTRALIA

Akzo, the Dutch chemicals and fibres concern, has agreed to acquire Stauffer Australia Ltd from ICI as part of a global policy of expansion with specific emphasis on the Australasian region. The value of the acquisition was not revealed.

It is understood that the Australian company has sales equivalent to "tens of millions of guilders", according to an Akzo spokesman.

Stauffer Australia, based in Parramatta, near Sydney, is involved in the production of chemicals, mainly for the papermaking industry.

It has three production sites and holds a 50 per cent stake in the speciality chemicals producer, Pacific Chemical Industries also located in Parramatta.

Akzo is looking to widen its speciality chemicals operations in the Far East and believes that gaining access to the markets of the Pacific basin is of strong strategic importance.

The company already operates eleven speciality chemicals joint ventures in Japan and in Malaysia, where the firm's presence includes two chemical divisions.

Chemical Markets Abroad

MITSUI PLANS MAJOR EUROPEAN PHENOL PLANT

Mitsui and Co, the Brussels-based trading arm of the Japanese major is planning to build a 150-250,000 ton/year phenol plant in Europe. Jack Veldhuizen, vice-president of Mitsui in Brussels told ECN the company had been examining the possibility of expanding phenol capacity for some time and estimates there is room in the market for a further 200,000 ton/year of product in Europe by 1990.

Currently, Mitsui has a 40-50,000 ton/year phenol commitment to the European merchant market and imports from the US, Soviet Union and Romania fulfill this requirement. Phenol is also plants. Two are operated by Mitsui Petrochemical Industries, shipped from three Japanese 150,000 ton/year and 30,000 ton/year at Chiba and Iwakuni-Ohtake respectively. The third is a 112,000 ton/year plant operated by Mitsui Toatsu Chemicals.

The new plant, which is planned to come on stream in the early 1990s, will alleviate the need for further imports.

In recent years phenol capacity in Europe has been reduced with BP and Shell in the UK closing their plants in 1985. Together these accounted for some 180,000 ton/year. These supply shortfalls coupled with healthy downstream growth for Bisphenol-A, resins and polyphenolin oxide point to increasing tightness in Europe.

The new plant will use cumene feedstock but so far Mitsui has not declared which process will be used. There are five licensors using oxidation of cumene; Hercules/BP, MW Kellogg, Mitsui Petrochemical, Montedison and UOP. Mitsui's plants in Japan use the BP/Hercules process.

Velhuizen said the company was studying sites in Antwerp and Rotterdam but would look in a 200km radius from the latter if necessary. Discussions with governments in both Belgium and Holland are underway. Mitsui is also considering the construction of a cumene plant on the site but extra considerations of benzene and propylene feedstocks are required. For this reason, Veldhuizen believes it may be more interesting and economic to ship cumene from the US, given the propylene supply situation in Europe is not clear in the near future. All cumene will be used captively in phenol production. This puts the plant in the 210-350,000 ton/year size range.

Mitsui said it was not averse to having a joint-venture partner particularly of it could find a long-term phenol buyer but said it would not be looking for technical or financial partnership.

Mitsui and Co in Brussels will market and sell the phenol throughout Europe and there is a "strong possibility" it will construct and own the plant too. At the moment there are no plans for Mitsui Petrochemical or Mitsui Toatsu to take part in the project.

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News of Mitsui's plant should bring cheer to Europe's phenol buyers who have been hit by supply problems throughout this year. With demand from derivative manufacturers forging ahead, contract prices have soared from DM1,350-1,400/ton in December to DM1,675-1,750/ton now.

Producers have faced major supply problems and have had to cut back on export business and put customers on allocation. With all available material tied up with contractual commitments, spot product has also been extremely short and small lots have been changing hands at elevated prices.

Material has been heard on offer at $1,500/ton fob (DM-2,512/ton) although there are no takers at this level. However, spot business has already been concluded as high as $1,300/ton fob and sources say that $1,400/ton is on the cards, particularly as there is only an estimated 1,000 ton of material available in Rotterdam.

With demand for phenolic resins expected to increase by 4-5 per cent this year, observers say the market can "only get tighter." Recent expansion has been confined to a 15,000 ton/year boost to Neste's Porvoo unit completed last year. Phenolchemie is expanding its plant at Gladbeck in West Germany by 70,000 ton/year by the end of this year and Montedipe has plans to add 30,000 ton capacity to its unit at Mantova in Italy.

Meanwhile in the US, Aristech is planting a 227-270,000 ton/year phenol plant on the Gulf coast.

DU PONT IN FRANCE

Du Pont's French subsidiary, Du Pont de Nemours, has provisionally agreed to take over Casco Nobel's finishes distribution activities. The deal is pending the necessary government authorizations and no figure for the sale has yet been released.

The distribution business, which will be transferred with its workforce of around 65 people, will be based at Arpajon, south of Paris. A spokesman at Du Pont de Nemours said that the acquisition characterized the firm's strategy linked to part of an overall move into a variety of areas. The spokesman claimed that such deals typified the company's policy of taking "little steps in the corporation's restructuring."

UCC AGREES LICENCE WITH ALBANY

Union Carbide Corp has reached agreement with Albany International of Albany, New York, to extend its licence to use the latter's hollow fibre membrane technology. Under the agreement UCC will have the right to use this technology in all gas and liquid separation applications.

Union Carbide currently has units installed at several customer sites using the hollow fibre technology in the nitrogen membrane systems. The systems were developed and are operated by the Linde division to supply industrial gases.

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In the European Market

Naphtha prices have firmed to $162-165/ton cif in line with stronger crude prices and news of an Opec production agreement.

Ethylene prices have picked up sharply to $450-460/ton cif NWE with strong demand and very little prompt product available. Three deals in NWE were done at $460/ton cif although sources say the market should steady at this level. The Libyan cracker should start up next week which should ease supply although most of its output is commited until July. Shell has had more start up problems at Berre and the cracker was not expected to be running before this week. Contract negotiations for Q2 are reported to be kicking off at DM830-860/ton.

Propylene has continued to firm with material still in very short supply. A number of small deals were reported over a range DM600/ton fob to DM615/ton cif and sellers are said to be setting on product waiting for further price developments. The contract to supply 7,500 ton of material to Turkey has been awarded to Enichem.

Butadiene surpluses now look to be under control after extensive co-cracking and sources say supply is tightening. After business was done at $220/ton last week, buyers nave had difficulty securing material below $230/ton. However, Q2 contract settlements are concluding some way below sellers' hopes at FF-1,900/ton.

Benzene prices have consolidated at $320-325/ton but with weak demand and plenty of product in Rotterdam. Traders are suggesting there is room for downward movement. A 1000 ton parcel was sold for $322/ton fob, one of the few deals in the market.

Trading in toluene has been put "on hold" as players assess the outcome of the Opec meeting and numbers have held at $255-265/ton. A prompt parcel is available at $255/ton cif from a Dutch trader but is unlikely to be taken in the current climate when other numbers of $262/ton fob are on offer.

Xylenes have moved up this week, with virgin at $300-305/ and solvent at $285-295 ton on the back of some virgin buying by a UK major. Demand however, is reported to be steady but anticipated supply shortfalls could lift prices. Mixed xylenes are fetching 90-91 cents/gallon in the US.

Paraxylene prices have remained at last week's levels in a quiet market and while there has been some interest in orthoxylene, no deals have been concluded leaving prices at $335-345/ton.

After last week's surge in styrene trading, prices have settled at $1695-1720/ton for T2 and $1680-1700/ton cif for T1. Most Q2 contracts, led by the West Germans, have been settled at DM2350/ton. There has been little activity although several European producers are known to be looking for product but unwilling to pay above $1700/ton for it.

Strong US demand has pushed European methanol prices to DM320-325/ton for T2 and $170-175/ton cif for T1. US prices have picked up to $200-220/ton cif and imports from Saudi Arabia and Bahrain as well as Rotterdam have been seen.

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News from the American Market

Tenneco will resume methanol output

After a nearly five-year absence, Tenneco Oil will become an active participant in the methanol market this year. The company expects to recommission its sole U.S. methanol plant at Pasadena, Tex., by August. The 125-million-gal/year unit was idled in 1983 because of low demand. Metallgesellschaft of Frankfurt, West Germany, has agreed to purchase a portion of the methanol output from Tenneco on a longterm basis. Metallgesellschaft is the parent company of Lurgi, which developed the low-pressure technology Tenneco's plant uses to produce methanol from natural gas. "Markets for methanol have improved substantially over the past year, and we believe that demand for methanol will remain strong," says Ralph S. Cunningham, president of Tenneco Oil Processing and Marketing. Tightness in the worldwide methanol market has resulted in a steady rise in prices during the past year and has led to much industry talk about which idled plants could be restarted. Ironically, most analysts have assumed that the cost of demothballing a plant would discourage any such projects. Capacity expansions, they reason, would make more economic sense. And Georgia Gulf just last week said it will expand its methanol plant at Plaquemine, La.

U.S. man-made fiber shipments improve

This year looks promising for most U.S. producers of man-made fibers, judging by January and February shipment data from the Textile Economics Bureau. Compared with shipments in the 1987 period, total man-made fiber shipments were 3.2% higher in the first two months of this year. Polyester shipments rose 3.8%, to 579.9 million lb. Nylon shipments slipped 2%, to 433.8 million lb, pulled down by a 6.6% drop in nylon industrial yarn, to 59.6 million lb. Shipments of rayon staple advanced 7.4% to 68.5 million lb, and olefin shipments rose 10%, to 259.9 million lb.

Georgia Gulf will expand capacity at seven plants

Georgia Gulf has begun to implement an expansion program that could increase its chemical capacity by 20%. The program follows a year-long study, which was initiated when it became clear that debt resulting from the company's 1985 leveraged buyout of assets owned by Georgia Pacific would be repaid "several years ahead of schedule," says John D. Bryan, vice-president for operations. In the first stage, which will be completed by early 1989 at a cost of less than $15 million, Georgia Gulf will increase annual capacities for: methanol, from 126 million gal to 140 million gal at Plaquemine, La.; vinyl chloride monomer, from 1.1 billion lb to 1.26 billion lb at Plaquemine; cumene, from 950 million lb to 1.25 bil- at Pasadena, Tex.; polyvinyl chloride (PVC) emulsion resin, from 30 million lb to 48 million lb at Delaware City, Del. Also, the polyol capacity at the Houston plant Georgia Gulf recently acquired from Freeman Chemical will be increased by 50%. Georgia Gulf is considering ex panding its PVC resin and phe nol plants at Plaquemine as wel Preliminary engineering indic tes that, with minor modific tions, capacities can be raised b 30% at the phenol plant and b 15% at the PVC unit. Construc tion for both projects could b gin this year and be complet in 1989. In addition, Georg Gulf says it is discussing est blishing a joint venture to oper te the company's 157-million- year phenol plant at Bou Brook, N.J.

P & G will supply high-purity glycerine

Procter & Gamble (P&G) dustrial Chemical Div. has ups ded the specification for Superol glycerine to 99.7% nimum glycerine from 99.5 Dow Chemical started sell synthetic glycerine having 99. minimum glycerine last year ter completing a moderniza program at its Freeport, T plant. Shipment analyses si 1986 show that P&G's glyce has been well above the 99 minimum and more typic 99.9%, the company says. P is the largest U.S. produce natural glycerine and is in process of nearly doubling capacity to 200 million lb/y Dow, meanwhile, is the lar domestic producer of synth glycerine, with capacity for million lb/year. Both Dow P&G have bowed to pressu reduce their list prices for cerine. Although glycerine sumption in pharmaceuticals kyds, food products and thane foam has been health surplus of glycerine stocks c nues to depress the ma sources say.

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News About New Projects

KELLOGG WINS FINANESTE ANTWERP CRACKER ORDER

MW Kellogg, a dresser Industries company, has won the order to build Finaneste's grassroots ethylene cracker at Antwerp in Belgium. A letter of intent stating that Finaneste, a 65 35 partnership between Belgium's Petrofina and Neste of Finland, intends to place the contract with MW Kellogg by mid-June at the latest, was given to the contractor on April 19.

For Kellogg the order represents a significant coup. In addition to serving as a valuable reference for its new Millisecond ethylene technology in Western Europe, the complex, the first grassroots ethylene plant in the region since Mossmorran could also possibly be the last there this century. The company has also won an order for Quantum's planned ethylene cracker in the US.

Finaneste has confirmed that the final choice was between MW Kellogg and Technip/KTI. Stone & Webster and Lummus Crest also competed. According to Finaneste, Kellogg presented the best proposal, specifically on points such as schedule, capacity, references and manpower availability.

The service contract, which will cover the know-how, basic and detailed engineering, procurement and construction supervision, has been put at BF1bn ($28.7m). Total investment in the cracker will be some BF19bn ($546m).

Kellogg will work in conjunction with Foster Wheeler italiana, which will be subcontracted to do some detailed engineering on the project. The Belgian general engineering company Tractionnel will also participate.

To be built on the left bank of the Scheldt river, the cracker will include eight furnaces. It will have a name-plate capacity of 450,000 ton/year (442,500 ton/year actual) of ethylene and will be designed to crack mainly naphtha although in the future 50 per cent of capacity could be fed on propane and 20 per cent on atmospheric gas oil. The companies met recently to discuss the propylene yields.

Kellogg's ethylene Millisecond technology is relatively new. The first plant to be based exclusively on this process has been in operation in Japan since 1985. The 250,000 ton/year facility belongs to Idemitsu Petrochemical.

Since then Kellogg has won orders for several new plants to be based on the process. These include a 150,000 ton/year plant in Bulgaria, a 400,000 ton/year unit at Kaohsiung, Taiwan, and a world-scale facility at Ulsan, South Korea. Other contracts include Millisecond furnace technology to be incorporated in existing ethylene plants in Canada and China.

The Antwerp plant, still on schedule for completion end-1990, will raise Finaneste's total ethylene capacity to 1m ton/year to be split by the partners according to the shareholding.

MONOMEROS COLOMBO PTA PLAN

Monomeros Colombo Venezolanos' $85-100m, 120,000 ton/year pure terephthalic acid project will initially be fed on paraxylene imported from the US or Canada. In the long term, the company hopes that Ecopetrol will expand its local production of aromatics.

The plant, planned at Barranquilla, in the northern part of Colombia, represents a major diversification for Monomeros.

A joint venture between Pequiven of Venezuela (47.23 per cent), Ecopetrol of Colombia (13.79 per cent), the Institute of industrial development, IFI (33.44 per cent) and DSM of the Netherlands (5.54 per cent) the company was founded in 1968 to supply intermediates to the synthetic fibres industry. By-product ammonium sulphate from its caprolactam facility has led Monomeros into fertilizers, particularly NPKs.

DSM provided the technology to produce NPKs by combining ammonium sulphate with nitric acid and phosphate rock.

Daniel Forero, manager of new products department, expects the PTA project to be financed 30 per cent from the company's own resources and 70 per cent from domestic and international loans.

Monomeros' sales last year reached $156m and net profit $16.6m.

JOHN BROWN CONTRACT

John Brown E & C Inc, A Trafalgar House company, has been awarded a contract for engineering and procurement services by Hoechst Celanese Corp for a nominal 9,000 ton/year capacity acetaminophen facility to be located at its existing plant site at Bishop, Texas. The work will be carried out in John Brown's Stamford, Connecticut office.

According to Hoechst Celanese, the project, when compl

ed. will make it the industry lea-
er in the manufacture of aceta-
inophen, which is a widely-us-
d aspirin-free pain reliever. The
lant will also produce para-hy-
roxyacetophenone (4-HAP) and
-tho-hydroxyacetophenone (2-
AP).

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Monsanto has declined to
mment on industry rumours
at its proposed joint venture in
e Soviet Union to produce gly-
osate (Roundup) herbicide has
t a stumbling block and been
ncelled.

The company maintains the
oposed venture would be a
od one and that discussions
e still on. In fact, a third party
s now entered the scene, pre-
med to be ministry of the che-
cal industry, which would sup-
some of the raw materials.

Until now the ministry of fer-
zer production and the US
n were the only partners in-
ved. Three locations are being
ked at — a greenfield site
two existing plant locations,
Ufa, however, because of en-
nmental problems.

A decision on the joint ven-
e was due to have taken place
the first quarter of this year.
s has been delayed and a
rer picture will now emerge
he end of May.

AMUL EXPANDS GELEEN NT

Vinamul Ltd, a subsidiary of
lever and major European
ducer of high pressure poly-
emulsions, plans to add a
her 24,000 ton/year of high
ssure polymer emulsion ca-
ty at Geleen, the Nether-
s, by the end of 1989.

he £8m ($15.2m) invest-
t will bring the group's total European emulsion capacity to 140,000 ton/year, of which 85,000 ton/year will be for pressure grades.

These products are based on the copolymerization of vinyl acetate with ethylene and vinyl chloride. More capacity is required to meet the growing needs of customers in the adhesive, building, paint, paper and texile industries, Vinamul says.

The latest project follows within two years of the opening of the Geleen factory.

UOP/TECNICAS REUNIDAS IN CHINESE LAB PROJECT

UOP Inc, a unit of Allied-Signal, has signed agreement with China National Technical Import & Export Corp (CNTIC) and the ministry of light industry to provide technology to the Fushun detergent chemical plant for the production of linear alkylbenzene (LAB) and linear olefins. Tecnicas Reunidas of Spain has won the engineering contract.

LAB is a price ingredient in the formulation of biodegradable detergents; linear olefins are used to produce fatty alcohols, also used in the detergent industry.

Under the licensing agreement UOP will provide its Pacol and detergent alkylate processes for the production of 72,000 ton/year of LAB and its Pacol and Olex processes to yield 54,000 ton/year of linear olefins.

Design of the units will incorporate UOP's LAB technology, to which significant improvements in product yield and quality have recently been added. The complex will be located in Fushun, Liaoning province, China.

When completed, the Fushun complex, which will be the second LAB facility licensed by UOP in China, will bring the country's nominal LAB capacity to 144,000 ton/year.

GEORGIA GULF TO RAISE CAPACITY

Georgia Gulf Corp of the US plans to increase capacity at seven of its plants in response to continued strong demand for its products. The programme is expected to be implemented in several phases beginning in the second quarter of 1988.

Under the first phase, the company is increasing capacity of its methanol plant from 360,000 to 420,000 ton/year and vinyl chloride monomer from 500,000 ton/year to 545,000 ton/year. Both facilities are at Plaquemine, Louisiana.

In addition the company is raising capacities at the Pasadena, Texas, cumene facility from 430,000 to 545,000 ton/year and the Delaware City, Delaware, PVC plant from 13,000 to 22,000 ton/year. Capacity at the recently acquired Freeman Chemicals Corp polypol plants will also be expanded by 50 per cent.

The projects are expected to be completed by early 1989 at an estimated cost of less than $15m.

SIMON-CARVES CONTRACT

ICI Pakistan is to add a third stream to its polyester polymer and staple fibre plant at Sheikupura, near Lanore, to produce an additional 7,000 ton/year.

Simon-Carves of the UK has been awarded the contract for the design and supply of equipment for the expansion project which has a total investment value of £11.7m ($22.2m). Completion is scheduled for the third quarter of 1989.

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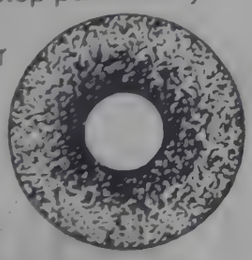

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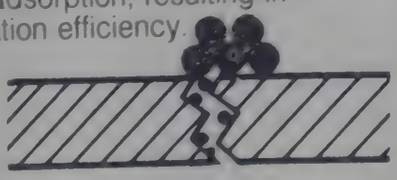

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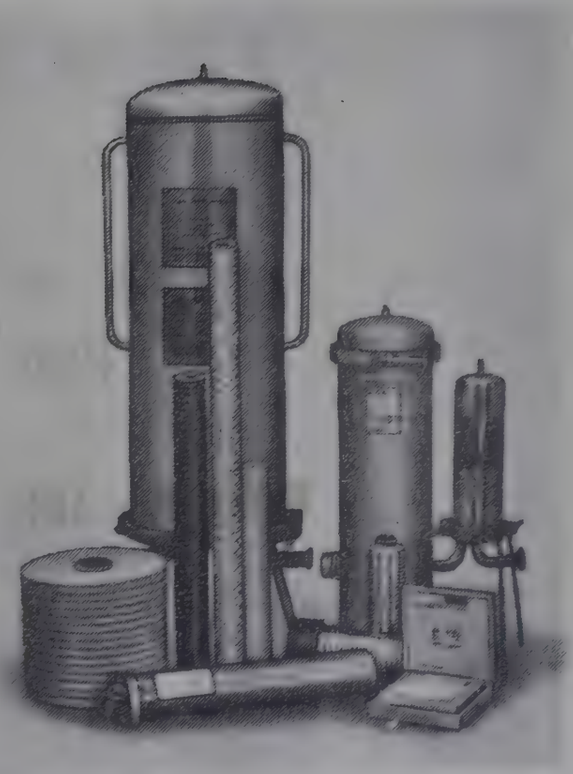

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Biotechnology

IRMS POISED TO UNVEIL IDS TRIALS RESULTS

Officials at the US food and rug administration are currenly reviewing three drugs for eating Aids-related conditions. lore than 100 clinical trials for otential Aids and Aids-related onditions are currently underay in the US. There is no indiation when the review of the ree drugs will be completed, ut such drugs are given top priity by the FDA.

"On average it takes about 4 months for a drug to go rough the full review process it if the data to support claims e presented, cancer drugs can ke about 12 months and it is pected that Aids drugs could through the review process thin six months," a spokesan said. "Zidovudine was reewed in less than four mons," he added.

The three drugs currently unr review are Syntex's anti-infective ganciclovir for treating cytomegalovirus, and two alpha interferons from Hoffmann-La Roche and Schering-Plough respectively for treating Kaposi's sarcoma.

Researchers at Burroughs Wellcome and the US national institutes of health are expected to report that a combination of zidovudine and alpha interferon does not appear to provide any notable benefits. The scientists will be presenting their findings to a convention of the American federation for clinical research.

More promising, however, are the results from two other zidovudine combination trials. An alternating zidovudine/dideoxycytidine regimen from Roche continues to look promising after six months of trials. DDC appears to reduce zidovudine's haematological toxicity without compromising efficacy. Similarly, researchers at the US national cancer institute, Burroughs Wellcome and Abbot Laboratories have recently reported that a half dose zidovudine/acyclovir regimen reduces bone marrow toxicity while T4 cell counts and health status look good.

Even though these trial results are only preliminary, the commercial potential of erythropoietin and colony stimulating factors could be reduced, according to Bon Kupor of the US-based Cable, Howse and Ragen. Epo and the CSFs may be useful in reversing zidovudine-induced anaemia.

Meanwhile, results from the first experimental immunization of humans against the Aids virus allow the researchers to suggest that the approach can be considered a prototype candidate against Aids. Daniel Zagury and his co-workers at the university P. et M. Curie, Paris, concede that there is no evidence at present to suggest the vaccine offers protection against the Aids virus. But antibodies produced were able to inactivate several strains of the virus, the researchers report.

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News from Japan

owa Cabot To Buy Mitsui oatsu's Carbon-black Bus.

Mitsui Toatsu Chemicals, Inc. s basically agreed with Showa nko K.K. that the former will ansfer in early July its car- n-black business (annual sal- : Yen 5,000 million) to Showa bot K.K. — owned 60% by owa Denko and 40% by Cabot rp. (US) — for about Yen 000 million. Showa Denko ill take over related produc- n facilities and about 80 em- oyees now engaged in the said siness.

Neither self-supplying raw aterial nor commercializing lated products. Mitsui Toat- Chemicals considers it diffi- lt to further promote carbon- ack operations by improving s international competitiveness nidst ongoing maturation of e international carbon-black arket.

On the other hand, Showa enko is contemplating build- g up its carbon-black business rough a closer tie-up with Ca- t. The transfer of carbon- ack operations between private mpanies belonging to differ- nt business groups may trigger estructuring of the domestic arbon-black industry.

Mitsui Toatsu is operating 3,000 and 30,000-t/y carbon- lack plants but has decided to ispose of the business opera- ons involved, so that it can con- enrate on stepping up its main- tay operations and exploiting ew business arenas.

Showa Cabot has a 85,000-t/y arbon-black plant at its Chiba actory. After taking over Mitsui oatsu's carbon-black opera- ons, it will command the second-largest market share (22%) in Japan. Its combined production capacity will reach about 160,000 tons a year.

Cabot—the world's largest producer of carbon black—has also established Showa Cabot Supermetals K.K. with Showa Denko. The joint company is manufacturing and marketing tantalum products.

Top Drug Maker Coping With Changes In Farm, Feed Business

Takeda Chemical Industries, Ltd., the top drug maker in Japan, started its Agro Division as of April 1 by combining its Agricultural Chemicals Division and Animal Health Products Division. This is intended to cope with the changes in the situation surrounding agrochemical and feedstuff business.

The company is now aiming at conducting agrochemical, veterinary-drug and feedstuff-additive business from a wider point of view — "agro business" — under a long-term plan to boost their business in Japan and abroad.

It sees the Japanese agricultural and stock-raising industries as having to face drastic changes under foreign pressure for market liberalization and other factors. It also feels the necessity to expand business overseas. In this context, it intends to enhance R & D strength as regards these areas, making the most of advanced technology.

Memorandum On GLP Data Signed Between Japan And West Germany

A memorandum has been signed between Japan and West Germany to effect mutual interchange of GLP data on chemical substances. As a result, it has become possible for both countries to mutually accept safety test data by confirmation from the other party that the data obtained conforms to GLP. This will greatly reduce the workload in testing conditions which are imposed on chemical manufacturers. It is expected that the U.K. will follow suit by joining in the agreement in the near future.

The signed memorandum follows others made in September 1986 and February 1987 on pharmaceuticals and pesticides, respectively.

In 1984, GLP standards were established for examinations of chemical substances and regulations for their production were established. It was decided that their decomposition and accumulation of toxicity should be under the control of the Ministry of International Trade and Industry, and their degree of toxicity under the jurisdiction of the Ministry of Health and Welfare. The two ministries have been jointly reviewing the 1985 proposal on mutually accepting GLP data, and as a result of their negotiations with West Germany, with assistance from the Ministry of Foreign Affairs, the memorandum concerned was completed on March 15 of this year.

With a view to gaining mutual acceptance of safety data on chemical substances among other countries that are members of OECD, the government agencies concerned will sign a

memorandum with the U.K. in the near future.

Dainippon Ink, La Roche Jointly Set Up Liquid-crystal Company

Dainippon Ink & Chemicals (DIC) and Hoffmann-La Roche A.G. set up a joint-venture liquid-crystal company on April 1. The new company name is "RODIC Co., Ltd," and will be producing and selling various liquid-crystal products. The parent companies are planning to concentrate their liquid-crystal business operations into this new joint-venture company.

A plant for this purpose is currently under construction within DIC's Saitama Plant (Saitama Prefecture). Liquid-crystal products produced at this plant will be marketed by the joint-venture company. The two parent companies are aiming at sales of Yen 2 billion in the first fiscal year.

The new joint-venture company is designed to mutually supplement DIC's liquid-crystal mixing technology and Roche's liquid-crystal bulk technology. The two parent companies hope that a comprehensive technological system resulting from their combined technology can adequately supply liquid-crystal products based on advanced technology.

For this purpose, the two parent companies have agreed to exclusively grant their own domestic patent rights to each other. It is reported that a business operation system advantageous for product and market development will be established within "RODIC".

The new Joint-venture company will take over the products which have so far been handled by DIC and La Roche. The number of products will reach a few hundred grades centering on TN (twist-nematic) type liquid-crystal products. They will be produced at a specialist plant currently under construction within the DIC's Saitama Plant. Liquid-crystal bulk, a source material, will be supplied for the time being from the main office of La Roche in Switzerland.

"RODIC" is set up on a fifty-fifty basis, capitalized at Yen 400 million.

The size of the global liquid-crystal market is put at 6 to 7 tons in volume and valued at around Yen 7 billion. Most of the demand comes from Japan. and the domestic market is shared chiefly by Merck Japan, Nippon Roche, Chisso Corporation, and DIC.

Shoden Importing U.S. Concrete Additive And Plastic Filler

Showa Denko K.K. (Shoden) has obtained the exclusive sales rights in the Far East region for ceramic "microballons" developed by PA Industries of the U.S. and has begun importing them. The products are used as fillers by mixing them with concrete and synthetic resins to impart strength and heat resistance, etc.

Compared with other equivalents, the microballoons are claimed to have high strength, high heat resistance and availability in a wide range of particle sizes. Shoden intends to import about 500 tons in the initial year for use in concrete to reduce weight and as fillers for various types of synthetic resins.

Conventional equivalents (hollow particles) made of pearlite, glass or other inorganic compounds have a problem with regard to strength, price or other properties. Shoden is marketing the new product (ordinary grade) at Yen 300 per kg.

Sumitomo, Hercules To Produc PAN-source Carbon Fibre In U.S.

Sumitomo Chemical Co. wil set up a joint venture for pro duction of carbon-fibre material in the U.S. with Hercules, Inc. the top U.S. maker of carbo fibre. Negotiations are now un der way between them to reac an agreement on the plan.

The two have basically agree to start a joint venture on a equal-ownership basis, produc PAN (polyacrylonitrile)-sourc precursor and prepreg for ca bon fiber after 1990 by utiliz ing Hercules, 1,700 t/y sca precursor plant at Decatur, Al bama on which construction said to have started.

Background factors are th U.S. federal government's actio to stimulate domestic produ tion of carbon fiber, the appa ent settling down of the yen appreciation and the transfer Japanese precursor manufactu ing technology to the U.S.

The U.S. Senate passed la last year bill which included clause stipulating that mo than 50% of the carbon fiber be supplied, after 1992, to t Pentagon and American ai craft and spacecraft make should be U.S. made. In 19 Sumitomo Chemical and He cules established an equal owned Japanese joint ventur Sumika Hercules Co., for su plies of precursor and prepr to Hercules and the Americ Market.

New Developments from Japan

Highly Transparent Fluoroplastic Successfully Developed

Asahi Glass Co. has developed "Cytop" fluoroplastic, which is completely different from conventional ones in terms of polymerization process, polymer structure and physical properties. The company has yet to announce the composition and structure of the new product but claims it has no equivalent anywhere in the world.

Its high degree of transparency gives it a markedly high permeation ratio for visible rays and ultraviolet ones : it has a higher permeation ratio for visible rays than polymethacrylate and polycarbonate. It does not suffer from quality deterioration resulting from absorption of the said rays. It is possible to produce ultrathin film therefrom using coating/casting methods since the product dissolves only in specified fluorine-based solvent.

The product — like existing perfluoropolymers (fluorinated ethylene-propylene copolymer, etc.) — has a conspicuously small refractive index. It has such a large Abbe number that it hardly causes chromatic aberration.

It, as well as polytetrafluoroethylene (PTFE), has a high degree of electrical insulation and a low dielectric constant. It is hardly affected by strong acids and alkalis, oil and solvent. Its thermal decomposition temperature is as high as PTFE's. In addition, it has higher yielding strength and modulus of elasticity than conventional fluoroplastics.

It will find outlets in the optical, electronic/electrical and chemical fields. The company has applied for 15 patents on the new produt and is planning to commercialize it next year.

Unique Herbicides Jointly Developed By Three Groups

The Sagami Chemical Research Center has developed, together with Chisso Corp. and Kaken Pharmaceutical Co., new herbicides which effectively kill weeds by inhibiting their chlorophyll synthesis.

The herbicides are oxazolidine compounds which have been produced in a variety of versions by substituting a particular group of the compound in question. The chemicals have proved effective against strong weeds in the fields and on non-crop land.

They can be used for fields of beans, corn, rice paddy fields or non-crop land. They are safe and act promptly on weeds.

The three groups will soon start chronic toxicity tests on the chemicals in a bid to commercialize them in five year's time. Oxazolidine compounds have so far been used as antibacterial agents but not as a herbicide in Japan.

2 Companies Start Joint Business In Silicone Gel For Sport Goods

Tonen Sekiyukagaku K.K. and Suzuki Sogyo Co. have reached agreement with regard to joint commercialization of silicone-gel products. Under the agreement Tonen — a petrochemicals producer — will tackle modification of raw material polymers and application development of silicone gel, and Suzuki — a shimizu-based sport-goods supplier — will be responsible for development of silicone-gel application to sport goods and also for market cultivation.

The two have also agreed to set up in six months' time, an equally owned company for R & D and manufacture of silicone-gel products, aiming at annual sales of Y5 billion by the new company within a few years.

Siicone gel is a low molecular polymer in a gel state which is produced by cross-linking two kinds of silicone polymer in the presence of a catalyst. This gel features shock absorption, vibration, isolation and good temperature charateristics and thus is considered to be suitable for use in sport goods and some industrial parts.

Fiber-reinforced Ceramics Developed By Hitachi

Hitachi Ltd., has developed a new-type fiber-reinforced ceramic using Avco (U.S.)'s SCS6 silicon-carbide fiber and a West German 'company's alpha-type silicon nitride.

The new product has double the fracture toughness of conventional silicon nitride. It is the addition of silicon-carbide fiber that has markedly raised the fracture toughness involved.

Silicon nitride has the highest degree of thermal resistance among ceramics. The brand-new ceramic having enhanced fracture toughness will be applied to cutting tools and structural materials.

Cisplatin Derivative Enters Clinical Tests As Anticancer Drug

Four domestic drug makers have inaugurated clinical tests on inhouse — developed car-

drug. The four are Nippon Kayaku, Bristol Myers, Shionogi and Chugai Pharmaceutical.

They have independently developed the product — a cisplatin derivative — in a bid to reduce the side effects of cisplatin, which include toxicity to the kidney, nausea and vomiting. Cisplatin has the most powerful anticancer effect among the anticancer drugs now under clinical trials but has the side effects, too. It calls for a large quantity of intravenous solution since it is toxic to the kidney.

Cisplatin has been marketed abroad since 10 years ago following confirmation in the States that it prevents cancer cells from multiplying. In Japan, Nippon Kayaku and Bristol-Myers started marketing the same product in 1984.

It is applied to the treatment of malignant tumors of the head and neck, testicular tumors, cancer of the bladder, prostatic cancer, ovarian cancer and tumors of the renal pelvis and ureter. Carboplatin will be used for the same purposes. The four makers claim that the new product is an "easy-to-handle" anticancer drug. Shionogi is laboring to develop the product in the form of an oral-use anticancer drug.

Sumitomo's alpha-IFN Can Be Applied To Hepatitis B

Application of alpha-interferon (alpha-IFN; tradename: Sumiferon) produced by Sumitomo Pharmaceuticals Co. to the treatment of hepatitis B has been formally approved by the authorities. On the basis of a technical tie-up with Wellcome (Britain), the company has produced the durg by affecting mass-cultured lymphocytes with Sendai viruses.

It began clinical tests on the product in 1981 and obtained production approval for it in January, 1987. At that time application of the product to kidney cancer and multiple myeloma was authorized: it was the first IFN to have its application to the treatment of kidney cancer approved.

The company has built the world's largest tissue-culture plant at its Niihama plant (Ehime Prefecture) and is marketing the product.

It is conducting clinical tests on the product with regard to its application to the treatment of adult T-cell leukemia and hairly-cell luekemia. It envisages calling on the authorities some time in the future to approve the said application of the product.

In Japan, application of Toray's Beta-IFN and recombinant alpha-IFN from Takeda Industries/Nippon Roche to hepatitis B was approved in 1986 and 1985, respectively.

AIDS Research Centered On Four Main Themes

The Ministry of Health and Welfare has decided to focus its AIDS research to be conducted in the current fiscal year on prevention of the outbreak of the serious disease, epidemiological research, grasping of actual conditions of the diseases, and development of animal models affected with AIDS viruses.

Only man and the chimpanzee are affected with AIDS viruses. A satisfactory cure has yet to be developed partly because there is no suitable model animal suffering from the disease.

The ministry aims to grasp the actual conditions of AIDS in a bid to find new subjects for medical check-ups intended for detecting the malignant disease.

It envisages promoting basic research on AIDS before the disease spreads throughout th country.

Technology To Obtain Fuel Alcohol By Biomass Developed By Research Assn.

Research Association for Pe roleum Alternatives Develop ment has established a fuel a cohol production system usin straw, sugar-cane bagasse ar wood. They have also been su cessful in demonstration pr duction based on this system.

This R & D project started fiscal 1983 and terminated in fi cal 1987. As a result of the co tinuous operation of a total be ch plant (installed within t Hofu Plant of Kyowa Hak Kogyo Co.), the production 99.5% pure dehydrated eth nol and the extraction of a solute alcohol was successful had been anticipated. The sociation says that it will foc its emphasis on commercializi the system in order to meet diverse requirements that en gy sources must provide.

Over the past eight ye Research Association for Pet leum Alternatives Developm has invested Y24 billion in search based on three pro themes, such as alcohol f production from biomass sou es and the consequent prod utilization of newly introdu fuel oils. As a result, 51 don tic and overseas patent ri were obtained before the j jects' final year, fiscal 1987

The association says tha aimed at establishing a c plete system for fuel alc (ethanol) production using called cellulose source mate such as straw, and inclu comprehensive demonstr and evaluation tests on the tem. The plant has a daily duction capacity of 150 to 2 of 99.5% pure ethanol fron kg of source materials.

MARKET INFORMATION

Metallic Salts up

The prices of metallic salts in the Bombay Chemicals market shot up owing to the price increase in metals by MMTC. Toluene continued to be in short supply. The import booking for TDA had gone up in the international market. A shortage was experienced in the market. Other major items ruled steady.

In the dyes section, shortage of basic intermediates had affected the dyes export. Tobias acid and MPD was in short supply. Even though export enquiries were good, shortage of dye intermediates is posing a serious concern.

We cannot guarantee the accuracy of the prices published in CHEMICAL WEEKLY as they are based only on the enquiries made by our correspondent — and, as such they are not FIRM PRICES as between a buyer and seller. The prices are published only with a view to giving some ideas of market conditions.

The prices are inclusive of Excise and Maharashtra Sales Tax.

(Prices as on 2nd June, 1988)

INDUSTRIAL CHEMICALS	Per kg
Ammonium sulphate	2.00
Ammonium phosphate (Mono)	14.50
Ammonium phosphate (Di)	12.00
Ammonium carbonate (Di)	17.00
Ammonium bicarbonate	4.75
Ammonium chloride	3.40
Ammonium nitrate	3.50
Arsenic white powder	21.00
Acrylamide (Resale)	57.00
Barium carbonate	6.00
Bleaching powder (33% Cl)	4.00
Borax (Granular)	14.00
Borax (Powder)	15.50
Boric acid (Tech.)	21.00
Bisphenol-A	56+57 ST
Butyl carbitol	45.00
Caustic soda (Flakes)	9.20
Caustic soda (Solid)	8.00
Caustic soda (Lye)	7.00
Calcium chloride 70% (solid)	3.25
Calcium chloride 75-80% (fused)	3.50
Calcium chloride 36% (Anhydrous)	5.00
Calcium Carbonate PPT	3.00
Calcium carbonate (Activated)	3.55
Camphor (Indian)	82.00
Cresylic acid	50.00
Cream of Tartar (Tech.)	70.00
Citric acid (Belgium) (Resale)	43.00
Citric acid (Indian) (Resale)	42.50
Copper sulphate	17.50
Chromic acid	50.00
Cyanuric chloride	120.00
Cobalt oxide	280.00
Carbitol	50.50+ST

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Para Toluene Sulphonamide
Para Chlorobenzene Sulfonamide
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Telex: 0175 : 401

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PARUL TRADING CO.
Room No. 10, 1st Floor,
310-312, Samuel Street, Bombay-400 003.
Phone: Office: 327105/337738
Resi.: 5122717

Dicalcium phosphate (Anhydrous)		16.00
Ferric Chloride (Lumps)		7.00
Ethylene urea		56.00
Glue flakes		8.45
Glue sheets		6.75
Gohsenol GH-17		105+ST
Hydro	(Resale)	40+ST
Hyflosupercell		20+ST
Hexamine	(Resale)	35.00
Industrial Wax		25.00
Litharge		15.00
Lead Acetate (Tech.)		28.50
Lithopone		15.50+ST
Magnesium chloride (Crystal)		1.00
Menthol crystal (Flakes)		185+Ex.+ST
Menthol bold		205+Ex.+ST
Menthol crystal bold		245+Ex.+ST
Magnesium carbonate (Japan)		16.00
Magnesium carbonate (Indian)		15.00
Maleic Anhydride (per kg)	(Resale)	45.00
Mercury (75 lbs.)		10,000.00
Nickel chloride		90.00
Oxalic acid	(Resale)	23.00
Peppermint oil (Rectified)		90+Ex.+ST
Potassium carbonate (Indian)		19.00
Potassium carbonate (Imported)		21.00
Potassium bichromate		22.00
Potassium phosphate (Mono)		14.00
Potassium phosphate (Di)		14.00
Polyvinyl alcohol (No. 117)		90+ST
Polyvinyl alcohol (No. 173)	(Resale)	100.00
Polyvinyl alcohol (No. 208)		105.00
Paraformaldehyde	(Resale)	21.00
Phthalic anhydride 36%	(Resale)	24.00
Pentaerythritol	(Resale)	51.00
Paraffin wax	(Resale)	14.50
Rangolite (German)		80+ST
Rangolite (Czech.)		54+ST
Sodium sulphate (Fine)		6.00
Sodium sulphate (Coarse)		5.00
Sodium sulphide 50-52% (Flakes)		8.00
Sodium sulphide 58-60% (Flakes) (TCL)		21.00
Sodium sulphide pure (Flakes)		12.25
Sodium nitrite	(Resale)	1500
Sodium chlorite 80% (Spain)		94.00
Sodium chloride 50% (Spain)		81.00
Santobrite (Indian)		36.00
Soda Ash (Tata)		4.00
Soda Ash (Birla)		3.80
Soda Ash (Imp.)		3.50
Sodium bicarbonate		5.25
Sodium bisulphite		4.50
Sodium silicate		3.00
Sodium acetate		6.00
Sodium alginate		140+ST
Titanium Dioxide (Anatase)		50+ST
Titanium Dioxide (Rutile — RCR_2)		69+ST
Tartaric acid (Crystal)		94.00
Trisodium phosphate		4.80
Thiourea		72+ST
Urea (Tech)		2.75
Vacuum salt		1.00
Zinc Dust		30.00
Zinc Oxide		30.00
Zinc chloride powder (technical)		14.00
Zinc sulphate		4.00

SOLVENTS		Per kg.
Acetic Acid (Glacial)	(Resale)	13.50
Acetic Anhydride	(Resale)	25.00
Acetone	(Resale)	13.50
Adipic Acid		51+ST
Aceto Acetanilide		50.00
Aniline Oil	(Resale)	42.00
Benzoate Plasticiser		33.00
Butyl Acrylate		100+ST
Butyl acrylate		95+ST
Butyl stearate		36.00
Butanol	(Resale)	34.00
Benzyl chloride		24.00
Benzo trichloride		16.00
Benzoyl chloride		22.00
Bromine Liquid		42.50
Chloroform		24.50
Carbon Tetrachloride		13.00
Cellosolve		42+ST
Cyclohexanone		50+ST
Cyclohexanol		43.00
Diacetone	(Resale)	35.00
Diethyl Oxalate		34.00
Diethylene glycol (DEG)		39+ST
Dioctyl Phthalate		52.00
Diallyl Phthalate		56.00
Dimethyl Phthalate		28.00
Dioctyl Adipate		52.00
Dibutyl Adipate		42.00
Dipentene		15.00
Dimethylamine 40%		12.00
Dimethylamine 60%		14.00
Ethyl Acetate		20.50
Ethyl Acrylate		46.00
Ethylene Dichloride		11.00
Ethylene Glycol		23.25
Formic Acid (Imp)	(Resale)	27.50
Formaldehyde	(Resale)	7.00
Glycerine (CP)		50.00
Glycerine (IW)		48.00
Hydrogen peroxide 50%	(Resale)	28.50
Isopropyl Alcohol		17.50
Iso Butyl Alcohol		28.00
	(Resale)	30.00
Monoethanolamine	(Resale)	49.00
Malamine		52+ST
Methyl Ethyl Ketone		45.00
Methyl Isobutyl Ketone		36.00
Methyl Acrylate		42.00
Methyl Dichloride	(Resale)	23.00

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RODENTICIDES
REPELLENTS
PHERMONES
CARDIAC GLYCOSIDES
ANTI CANCER DRUGS
LITHOPONE
RANGOLITE
POTASSIUM & SODIUM HYDROXIDE
OXALIC ACID
ESSENTIAL OILS AND
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EPICHLOROHYDRIN
1:4 DIOXANE
HYDROXYLAMINE SULPHATE
3,4,5 TRIMETHOXY BENZALDEHYDE
ETHYLENE CHLOROHYDRIN
CALCIUM CARBONATE
METHYL ETHYL KETOXIME
DIBUTYL TIN OXIDE
ALLYL CHLORIDE
LITHIUM HYDROXIDE/CARBONATE

Please Contact :

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Mehsana Mansion No. 2, Block 3,
Tejpal Road, Vile Parle (East), BOMBAY-400 057.
Telephone : .6140800

Meta Cresol	45.00
Nitrobenzene	17.00
Nitric Acid (Con.) (RCF)	2.50
Ortho Cresol	30+ST
Phenol (Resale)	30.50
Propylene Glycol	33.50+ST
Polyethylene Glycol (No. 200)	37.00
Polyethylene Glycol (No. 400)	40.00
Polyethylene Glycol (No. 500)	42.00
Polyethylene Glycol (No. 1600)	14.00
Polyethyene Glycol (No. 4000)	38.00
Polyethylene Glycol (6000)	50.00
Para Cresol	40.00
Styrene monomer	44+ST
Sorbitol	18.50
Sulphuric Acid	2.10
Trichloroethylene	27.00
Triethanolamine (Resale)	49.00
Turpentine Oil (Germany)	8.00
Turkey Red Oil (50%)	11.75
Triethylamine	50.00
Vinyl Acetate Monomer	41.00

SOLVENTS	Per Litre
Benzene	10.00
N-Heptane	8.00
N-Hexane	8.75
Methanol	8.25
Solvent Naphtha Heavy	9.50
Solvent Naphtha Light	8.50
Toluene	11.00
Xylene	14.50

DYES INTERMEDIATES (PRICES ARE WITHOUT TAX AND EXCISE)	
Alphanaphthylamine	60.00
Alpha Naphthol (Imp.)	170.00
Aceto Acetic Ester (Methyl)	63.00
Ammonium Molybdate	180.00
Anthraquinone	70.00
Anthranilic Acid	60.00
2-Amino-4-Nitrophenol (Imp.)	125.00
Blue B. Base (Local)	230.00
Beta Naphthol (Atul)	58.00
Benzidine Dihydrochloride (BDH)	80.00
Bromamine Acid	375.00
BON Acid	105.00
Chicago Acid	280.00
Coach Acid	56.00
C. Acid (Imp.)	260.00
Cyanuric Chloride (Japan)	116.00
2, 4, DNCB	26.00
Dihydrothio PTOS (Imp.)	600.00
Dimethyl Aniline	58.00
Diethyl Aniline	160.00
Di-amino stilbene disulphonic acid	118.00
3, 3-DCB (Imp.)	180.00
Gamma Acid (Atul)	170.00
H. Acid (Atul)	155.00
G. Salt	57.00
Isophthalic Acid	40.00
J. Acid	255.00
J. Acid Urea	275.00
K. Acid	95.00
MDPS (German)	200.00
MNA	80.00
Meta Unido Aniline	140.00
MPD (Local)	120+Ex+Tax
MPD (Japan)	200.00
Naphthenic Acid	12.00
N-Methyl J. Acid	380.00
N-Methyl Aniline	115.00
Naphthalene (Refined)	21.00
Naphthalene (Refined)	23.00
Ortho Anisidine (OA Imp.)	85.00
Ortho Dichloro Benzene (ODCB)	11.25
OT Base	95.00
Para Dichloro Benzene (PDCB)	16.00
Para Anisidine (PA-Imp.)	110.00
Para Anisidine (PA-Local)	87.00
PNA	68.00
Para Cresidine (Imp.)	325.00
Para Amino Azo Benzene (India)	130.00
PNCB	28.00
Para Amino Acetanilide	145.00
1-Phenyl 3-methyl-5 Pyrazolone	118.00
Phenyl J. Acid	350.00
Para Amino Benzoic Acid	170.00
PT Base	88.00
Rhoduline Acid	490.00
Resist Salt	20.00
Resorcinol	140.00
Sodium Naphthionate	65.00
5-Sulpho-Anthranilic Acid	60.00
Sulphanilic Acid	25.00
Sulpho Tobias Acid	105.00
Trichloro Benzene (TCB)	15.00
Tobias Acid	116.00

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MAGNESIUM HYDROXIDE POWDER IP
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Contact Manufacturers & Exporters :

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303-A, Vrindavan, Ramachandra Lane, Malad (West), Bombay-400 064.
Phone : Office : 685559/697422 Telex : 011-78081 ARUN IN Gram: "DEVOTION"

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DELHI:
10896, Mandir Road,
Manakpura,
Near Karol Baug,
New Delhi-110 005.
Phone : 770433

AHEMEDABAD :
6, Uttra Apartments,
Opp. Ajanta Commercial Centre,
Near Navjiwan Press,
Ashram Road,
Ahmedabad (Guj.).
Phone : 409953

REGD. OFFICE :
Narmada Chambers, II Floor,
36, Maharaja Agrasen Marg,
Sapna Sangeeta Main Road,
Indore-452 001.
Phone : 61603 Cable : BETA
Telex : 735 349 BNPL IN

WORKS :
5, Industrial Area,
Maksi,
Distt.: Shajapur, M.P.
Phone : 78 & 79

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Please Contact:

ROLEX CHEMICAL INDUSTRIES PVT. LTD.

Office: 230, Samuel Street, Bombay-400 003.
Gram: "MANGALPUJA", Bombay
Phone: Office: 325957-58
Factory: Plot No. N-27, MIDC, Tarapur Industrial Area, Boisar, Dist. Thane, (Maharashtra)

Bombay dyes market

(Prices as on 2nd June, 1988)

ACID COLOUR	Per Kg.
Acid Violet 4BS	143.00
Acid Maroon V	110.00
Acid Orange II	77.80
Acid Orange IIY	63.05
Acid Red A	107.25
Crosein Scarlet MOO	155.00
Acid Scarlet 3R	99.90
Acid Red 38N	135.00
Acid Red R2R	132.00
Acid Red RS	88 00
Acid Green V	230.00
Acid Patent Blue AS	250.00
Acid Coomasi Blue	200.00
Acid Yellow 5GN	65.00
Acid Red PG	85.00
Acid Red GRS	78.00
Acid Black 10 BX	121.95
Acid Black BX	98.40
Acid Black Wax	135.50
Procinil Yellow GS (ICI, UK)	265.00
Procinil Red GS (ICI, UK)	530.00
Procinil Blue RS (ICI, UK)	315.00
Procinil Scarlet G (ICI, UK)	600.00
Procinil Orange G (ICI, UK)	250.00
Procinil Rubine (ICI, UK)	550.00

DIRECT COLOURS	Per Kg.
Yellow 3GX	88.10
Gun Yellow RCH	124.00
Fast Yellow GCH	141.15
Yellow CFG Hly. Conc.	312.00
Fast Yellow GS	111.65
Fast Yellow CHRS	95.45
Viscose Orange A	166.15
Fast Orange GR	133.75
Red	96.90
Dark Tan	78.25
Red IIR	72.55
Red 4B	169.10
Bordeaux BW	132.30
Fast Scarlet 4BS	166.55
Red 12B	170.55
Bordeaux Hly. Conc.	194.00
Cotton Red N	117.05
Brill. Fast Helio B	278.00
Brill. Fast Helio 2B	297.00
Brill. Fast Helio 2RS	136.20
Brill. Fast Helio BS	116.10
Brill. Violet Extra	126.40
Blue 2B	86.60
Blue G	170.50
Sky Bue FB	188.25
Copper Blue GR	147.00
Fast Greenish Blue GL	114.60
Developed Black BT	116.10
Blue NB-2B	300.20
Blue NB-2BC	185.30
Developed Black NB-GHB	185.30
Green B	111.65
Green NB-B	188.25
Green 2B-N	188.25
Brown MR	154.40
Brown CN	107.25
Golden Brown G	140.35
Catechin G	120.50
Omega Tan	126.40
Catechin GS	102.80
Black E Hly Conc.	142.60
Black E Extra Hly. Conc.	142.60
Black NB-ER Hly. Cone.	310.50

DISPERSOL COLOURS	Per Kg.
Yellow 6G Powder	143.80
Red B 3B Powder	247.80
Red B 2B Powder	323.20
Red CB Powder	439.15
Red D2B Powder	477.40
Violet C 4R	521.90
Blue BG Powder	235.45
Blue BN Powder	103.75
Blue D 2R Powder	476.25
Navy BT Powder	243.90
Blue B 2G Powder	210.20
Black BT Powder	182.60
Blue BR Powder	390.20
Yellow 7GL	338.60
Yellow 5RX	218.80
Yellow 3G	367.25
Yellow	140.00
Yellow AL	135.30
Yellow Brown REL	247.50
Yellow FFL	463.60
Gold Yellow GG	259.70
Pink REL	247.00
Red REL	468.65
Red 2B	327.40
Red FB	324.20
Red Violet FBL	469.85
Orange 3R	196.65
Violet 3R	280.00
Violet RL	275.45
Violet 6R	485.75
Scarlet RR	214.80
Rubine 3B	223.00
Rubine CB	364.90
Blue GL	318.90
Blue BGF	636.50
Navy Blue RF	270.40
Brown 3REL	200.40
Black GEL	324.20
Dark Brown 3B	317.40

BASE COLOURS	Per Kg.
Fast Yellow GC	80.20
Fast Orange GC	135.45
Fast Scarlet R	166.90
Fast Scarlet RC	126.65
Fast Scarlet RCR	99.05
Fast Scarlet G	121.65
Fast Scarlet GN	91.50
Fast Scarlet GG	72.70
Fast Scarlet GGS	72.75
Fast Red B	203 20
Fast Red RC	119.15
Fast Red R Flakes	149.25
Fast Red TR	166.80
Fast Red TR Oil	183.15
Fast Red RL	237.10
Fast Red KB Oil	201.90
Fast Bordeaux GP	201.95
Fast Garnet GBC	94.00
Fast Violet B	505.60
Fast Blue BB	521.40

NAPHTHOL COLOURS	Per Kg.
ASG	217.00
AS	143.00
ASSW	279.75
ABBS	189.15
ASBO	195.65
ASD	175.50
ASOL	179.35
ASTR	279.75
ASPH	279.75
ASE	196.05
ASEI	184.40
ASLB	1632.60
ASBT	1817.00
ASWG	143.00
ASSG	397.70
ASSR	480.50

PROCION COLOURS	Per Kg.
Golden Yellow HR	181.80
Brill. Yellow H4G	117.85
Supra Yellow H-8GP	168.55
Brill. Yellow HE6G	166.95
Yellow H-E4R	276.05
Brill. Yellow H7G	332.30
Yellow M4R	243.95
Yellow M GR	326.05
Brill. Yellow M4G	177.10
Brill. Yellow M8G	332.30
Yellow M 3R	217.60
Brill. Orange H 2R	241.85
Brill. Red H 7B	157.95
Brill. Orange M 2R	313.15
Brill. Red H 8B	169.45
Brill. Scarlet H RN	245.05
Supra Red H-3BP	179.30
Brill. Red H-F3B	243.45
Brill. Magenta HB	167.00
Brill. Red M 5B	98.90
Brill. Red M 8B	173.70
Brill. Pink MB	137.10
Brill. Magenta MB	121.55
Brill. Purple H-3R	180.20
Brill. Purple H-7R	175.40
Navy Blue H 3R	298.50
Brill. Blue H-GR	366.55
Brill. Blue H 5G	173.10
Blue H 5R	283.85
Brill. Blue H 7G	178.70
Brill. Blue H 7RX	358.15
Turquoise HA	234.45
Supra Blue H-3RP	335.70
Supra Turquoise H 2GP	181.50
Blue H-ERD	305.80
Navy Blue H ER	258.60
Blue H 5RX	269.30
Navy Blue M 3R	310.95
Brill. Blue MR	331.70
Brill. Blue M RX	214.20
Brill. Blue M-G	382.30
Blue M 4GD	344.60
Navy Blue M RB	318.75
Turquoise M-G	197.85
Brill. Blue M GX	302.50
Blue 3R Acra Powder	718.20
Dark Brown H 6R	248.45
Cobalt Oxide (per kg.)	285.00
Green H 4BD	269.80
Green H-E4BI	169.80
Red Brown H IF	143.25
Orange Brown H 28	209.05
Brown M GRN	188.80
Black H-N	283.35

SULFUR COLOURS	Per Kg.
Navy Blue	99.85
Green G	198.55
Black Grains Extra	63.05
Black Grains OG	64.55
Black GXE Conc.	61.60
Black GXE	52.75
Black GXR	61.60
Black Grains 800	54.20
Black EXR Grains	64.55
Black EXR Grains 800	51.25

VAT COLOURS (ICI)	Per Kg.
Yellow 5G Powder Fine	673.15
Yellow 5G Supra Disperse	439.30
Yellow 5G Acra Con.	628.75
Yellow 3R Powder	588.85
Gold Orange 3G Pdr. Fine	952.15
Brill. Orange 6R Pdr. Fine	624.35
Gold Orange 3G Supra Disp.	601.30
Brill. Orange 6RX Powder	394.30
Brill. Red 3B Pdr. Fine	997.80
Brill. Red 3B Supra Disp.	713.20
Brill. Purple 4R Conc. Pdr.	470.75
Brill. Purple 3R Acra Powder	690.85
Brill. Purple 2R Hly Conc.	597.90
Brill. Purple 4R Supra Disp.	500.05
Brill. Purple 2R Acra Conc.	625.95
Blue R Powder Fine	542.15
Blue BC Conc. Pdr. Fine	522.50
Blue BC Acra Conc. Pdr. Fine	762.70
Blue R Conc. Pdr. Fine	577.65
Blue RR Supra Powder	629.35
Blue Conc. Powder	645.80
Brill. Blue 2R Hly. Conc.	378.55
Brill. Blue 2R Supra Disp.	115.65
Dark Blue 2R Powder Fine	380.25
Blue BC Supra Disp.	359.40
Jade Green XBN Powder Fine	438.20
Jade Green XBN Acra Conc. Powder	823.90
Jade Green 2G Pdr. Fine	419.65
Jade Green 2G Ptg. Faste	125.40
Jade Green XBN Ptg. Paste	126.00
Jade Green 2G Supra Disp.	496.00
Olive Green B Pdr. Fine	399.90
Olive D Pdr. Fine	444.30
Olive Green B Supra Disp.	308.26
Jade Green XBN Supra Disp. (N)	327.30
Olive OMW Pdr. Fine	698.55
Olive OMW Supra Disp.	538.05
Olive R. Pdr. Fine	422.96
Olive D Supra Disp.	361.70
Olive R Supra Disp.	363.90
Olive D. Ptg. Paste	193.00
Olive Green B. Ptg. Paste	199.10
Olive Green B Acra Conc.	542.75
Olive R Acra Conc.	640.00
Olive Green B Acra Conc.	542.75
Brown R Pdr. Fine	835.00
Brown G. Pdr. Fine	795.00
Brown R Pdr. Fine	659.75
Dark Brown 3R Pdr Fine	685.00
Brown G. Supra Disp.	449.90
Brown 2G Supra Disp.	554.00
Brown R Supra Disp.	422.95
Brown BR Powder	719.00
Dark Brown 3R Ptg. Paste	217.15
Dark Brown 3R Supra Disp.	414.55
Brown G Acra Conc.	733.95
Brown R Acra Conc.	766.00
Grey M. Powder Fine	748.80
Grey M. Supra Disp.	585.45
Blue BC Acra Conc. Pdr. Fine	762.70
Direct Black AC Supra Disp.	330.35
Direct Black AC Pdr. Fine	474.70
Direct Black CH Supra Disp.	393.20
Direct ACD Ptg. Paste	217.15

Delhi Market

DELHI : JUNE 3, (NNS) --- Tartaric acid slumped by Rs. 100 per quintal in the local chemicals market during last week, Owing to nervous unloading by stockists caused by paucity of money, says NNS. Zinc oxide also nose-dived sharply by Rs. 3000 per tonne, while paraffin wax and refined wax hardened by Rs. 30 each in the absence of arrivals from Assam. Turnover throughout the week was poor owing to poor demand by mills due to power crisis.

Tartaric acid suffered a fall of Rs. 100 at Rs. 6400 per 50 kg. owing to dehoarding tendency by stockists as well as increased import from France. Citric acid also ruled easy at Rs. 2050/2400 in spite of seasonal demand, but stock position was sufficient. Zinc oxide inferior suffered a steep fall of Rs. 3000 at Rs. 32,000 on withdrawal of demand, while superior quality ruled steady at Rs. 40,000.

Paraffin and refined wax hardened by Rs. 30 each at Rs. 630 per 50 kg. and Rs. 730 per 62½ kg. in the absence of offering from Assam due to flood. Its prices hardened further due to acute shortage of stocks. Menthol flake, medium and bold jumped up from Rs. 171 Rs. 184 and Rs. 190 to Rs. 188, Rs. 195 and Rs. 200 per kg. on heavy stockists demand in anticipation of fall in production due to shortage of water and very hot weather. Mentha oil also jumped up sharply from Rs. 135 to Rs. 150 DMO traded higher at Rs. 75 against Rs. 65.

In the absence of fresh arrivals, sodium nitrite improved by Rs. 25 at Rs. 750/775. Sodium nitrate also quoted higher from Rs. 400/425 to Rs. 440 owing to acute shortage of stocks. Acid slurry soft and hard hardened by Rs. 1 each at Rs. 23 and Rs. 31 in the face of increased prices of raw material along with brisk demand by detergent powder manufacturers.

Soda ash and soda caustic flakes ruled static at Rs. 270/300 and Rs. 400 on good seasonal consumption. Mercury ruled static at Rs. 10,500 flask due to paucity of arrivals. Turnover was moderate in other chemicals in the absence of demand by outstation buyers due to very heat.

Dyes and colours also remained unchanged.

(DELHI MARKET RATES AS ON JUNE 3, 1988)

Ammonia Bicarb (per 25 kg)	118.00
Mercury (per flask)	10,500.00
Soda ash (per bag)	270-300.00
Ammonium chloride (per 50 kg)	115-180.00
Caustic soda solid	No Stock
Caustic soda flakes (per 50 kg)	410.00
Citric acid (per 50 kg)	2050-2400.00
Stable Bleaching Powder Shriram (per 25 kg)	95.00
Stable Bleaching Powder KCI (per 25 kg)	85.00
Stable Bleaching Powder MODI (per 25 kg.)	90.00
Sod. Bicarbonate (per 50 kg)	260-280.00
Sod. Hydro Sulphite (per kg)	38.50-40.00
Rangolite (per kg)	48-65.00
Boric acid Technical	
Paraffin wax (per 50 kg)	630.00
Tartaric acid (per 50 kg)	6,400.00
Borax Granular (per 50 kg)	575.00
Borax Crystal (per 50 kg)	600.00
Sodium Nitrate (per 50 kg)	440.00
Sodium Nitrite (per 50 kg)	750-775.00
Camphor Powder (per kg)	87.00
Camphor Thal (per kg)	97.00
Menthol Medium (per kg)	195.00
Menthol Flakes (per kg)	188.00
Menthol Bold (per kg)	200.00
Glycerine (per kg)	42-43.00
Sodium Silicate (per quintal)	200-250.00
Hexamine (per kg)	35.00
Acetic Acid Glacial (per kg)	13-13.50
Copper Sulphate (per quintal)	1800-2100.00
Formic acid (per kg)	26.50
Formaldehyde (per kg)	8.00
Hydrogen Peroxide (per kg)	30-32.00
Calcium Carbonate (per tonne)	2500-4000.00
Acid Slurry Soft (per kg)	23.00
Acid Slurry Hard (per kg)	31.00
Phosphoric Acid (per 50 kg)	825.00
Pot. Nitrate (per quintal)	900-1200.00
Pot. Permanganate (per 50 kg)	2300.00
Sod. Bichromate (per 50 kg)	1050-1150.00
Tri-Sod. Phosphate (per 50 kg)	325-360.00
Titanium Dioxide Anatase (per kg)	48.50
Titanium RC-822 (per kg)	63.00
Zinc Oxide (per mt)	32,000-40,000.00
Phenol Carbolic Acid (per kg)	33.00
Carbon Tetrachloride (per kg)	19.00
Chloroform (per kg)	28.00
Sodium Sulphate (per 50 kg)	160-170.00
Naphthalene Balls (per 50 kg)	1400.00

DYES & COLOURS	per kg
Naphthol AS	150.00
Naphthol ASG	235.00
Naphthol ASBS	200.00
Naphthol ASTR	302.00
Naphthol ASOL	191.00
Naphthol ASBO	208.00
DIRECT DYES	(per kg)
Black E. Conc.	92-155.00
Diazo Black B.T.	125.00
Green B.	119.00
Blue 2-B	86.00
Sky Blue FB	200.1[illegible]
Basic Auramine O Conc.	55-100.00
Basic Rhodamine B.500%	220-320.00
Basic Methylene Blue	92-130.00
Basic Violet	142-160.00
Basic Malachite Green	160-185.00
Acid Orange	45-52.00

Madras Market

Markets were generally dull with good inquiries for Hydros, Diethylene Glycol etc, which were under short supply. Methanol continues to be under short supply with the local manufacturing units not able to meet the demand. The import of methanol by the canalising authority is inordinately delayed putting the consumers especially in the southern region to considerable difficulty.

Consequently products like Formaldehyde are in great demand.

(MADRAS MARKET RATES AS ON JUNE 4, 1988)

Acetic Acid — Glacial (per kg)	17.00
Acid Slurry (Soft) (per kg)	26.00
Aluminium Sulphate Iron free (per tonne)	1,700.00
Ammonium Bi-carbonate (per 25 kg.)	125.00
Ammonium Chloride SPIC (per tonne)	1800.00
Bleaching Powder — Mettur (per 25 kgs. bags)	100.00
Borax Granular	660.00
Cresylic Acid 100% (per kg)	85+E.D
Meta Cresol 40/42% (per kg)	47.00+E.D
Para Cresol 80/85% (per ton)	60+E.D
Caustic Soda Flakes (Mettur) (per ton)	8,800.00
Caustic Soda Flakes (Andhra Sugar)	8,800.00
Citric Acid — Indian (per kg)	45.00
Copper Sulphate (per 50 kg.)	1000.00
Formic Acid (India) (per kg)	27.00
Formaldehyde (per kg)	9.00
Glycerine (per kg)	42.00
Hydrosulphite of Soda TCPL (per kg)	35.00
Hydrosulphite of Soda IDI (per kg)	38.00
Hydrosulphite of Soda BASF (per kg.)	38.00
Hydrogen Peroxide (India) (per kg.)	35.00
Hyflo Supercell	19.50
Magnesium Carbonate Light	18.00
Potassium Bichromate (per kg)	26.00
Phosphoric Acid (per kg)	18.00
Phthalic Anhydride (per kg)	24.00
Pentaerythritol (per kg)	62.00
Paraffin Wax (per kg)	13.50
Oxalic Acid (per kg.)	20.00
Soda Ash (TAC) (Per 75 kg)	306.00
Soda Ash (TATA) (per 75 kg)	310.00
Sodium Cyanide Indian (per kg.)	47.00
Sodium Cyanide Degussa (per kg)	75.00
Sodium Bichromate (per kg)	18.00
Sodium Bicarbonate (per 50 kg)	280.00
Sodium Nitrite (per 50 kg)	675.00
Sodium Nitrate (per 50 kg)	425.00
Sodium Silicate (per tonne)	4000.00
Sodium Sulphate (per tonne)	3500.00
Sodium Sulphide Flakes (per tonne)	13,000.00
Sodium Bi-sulphite (per 50 kg)	180.00
Stearic Acid (per kg)	32.00
Trisodium phosphate (per 50 kg)	380.00
Titanium Di-oxide Indian TTP (per kg)	49.00
Titanium Di-oxide Indian Rutile (per kg)	59.00
Urea Tech (per tonne)	2800.00
Zinc Oxide (per kg.)	34.00
Zinc Chloride Powder (per kg.)	13.00
Zinc Sulphate (per tonne)	4,500.00
Di-octyl phthalate (per kg.)	46.00
Di-butyl Phthalate (per kg)	46.00
Hexamine (per kg)	28.00

SOLVENTS

Acetone (I.O.C.) (per kg)	16.00
Isopropyl Alcohol NOCIL (per kg.)	21.60
Diacetone Alcohol NOCIL (per kg)	26.50
Benzene SAIL (per kg)	14.00
Diethylene Glycol NOCIL (per kg)	34.00
Butanol NOCIL (per kg)	35.00
Toluene SAIL (per litre)	12.00
Xylene IPCL (per litre)	14.00
Phenol HOC (per kg)	28.00
Turpentine (per litre)	16.50
Sorbitol (per kg)	35.00
Trichloroethylene MCIC (per kg)	23.50
Carbon Tetra Chloride (per kg)	15.50
Chloroform (per kg)	26.00
Methylene chloride (per kg)	25.00
Methyl Ethyl Ketone (per kg.)	42.00
Cellosolve (per kg)	50.00
Triethanolamine (per kg)	23.50
Ethyl Acetate (per kg.)	22.00
Butyl Acetate (per kg)	38.00
Methanol (per litre)	9.00

MATERIALS IMPORTED

BOMBAY
(Cost of Imported Item is CIF Value)
(From 28-1-88 to 29-1-88)

ACETANILIDE: From Hungary: Qure Drugs Pvt. Ltd., 15 mts., Rs. 2,48,234.

ACETANISOL: From Switzerland: Oriental Aromatics., 25 kgs., Rs. 8,556.

ACETIC ANHYDRIDE: From FRG: AP Chemicals, 50,040 kgs., Rs. 5,46,553; From USA: Triochem Products Ltd., 32,332 Mts., Rs. 3,27,424.

ACETONE: From FRG: Gujarat Lyka Organics Ltd., 12,714 Mts., Rs. 1,04,818.

ACRYLAMIDE: From Germany: Hyderabad Deccan Cigarette Fac., 5,000 kgs., Rs. 97,375. From Japan: Patidar Textiles, 1,000 kgs., Rs. 19,859.; Verb Chemical Industries, 5,000 kgs., Rs. 97,375., From Singapore: V.J. Enterprises, 5,000 kgs., Rs. 97,375.

ACRYLIC MOULDING POWDER: From Switzerland: Spica Plastic, 35,000 kgs., Rs. 4,40,202.

ALDEHYDE ISO C11: From Switzerland: Oriental Aromatics, 50 kgs., Rs. 53 848.

ALLYL AMYL GLYCOLATE: From Netherlands, Viraram Pvt Ltd., 25 kgs., Rs. 18,992.

ALUMINIUM OXIDE: From China: Grindwell Norton Ltd., 40,000 kgs., Rs. 2,69,013; From France: Grindwell Norton Ltd., 4,000 kgs., Rs. 60,587.

ALUMINIUM OXIDE SYNTHETIC: From FRG: Mukul Enterprises, 18,000 kgs., Rs. 2,27,330.

4-AMINOBENZOIC ACID BENZYL ESTER: From Switzerland: Sandoz (India) Ltd., 1,895 kgs., Rs. 4,54,345.

AROMATIC CHEMICALS: From Netherlands: Viraram Pvt. Ltd., 25 kgs., Rs. 8,863; 25 kgs., Rs. 9,044; 5 kgs., Rs. 9,804; 10 kgs., Rs. 9,044.

ARSENIC TRIOXIDE 98%: From China: Lucky Industries, 17 Mts., Rs. 1,23,601.

2 B ACID: From UK: PDI Chemicals Ltd., 600 kgs., Rs. 59,421.

N BUTANOL: From FRG: Citroflex Pvt. Ltd., 66,300 kgs Rs. 7,26,028.

1-N-BUTYL-3-CYANO-6-HYDROXY-4-METHYL - PYRIDONE 2: From Switzerland: Sondoz (India) Ltd., 3,164 kgs., Rs. 3,21,015.

CALCIUM CITRATE: From Indonesia: SLV Chem Citrus Ltd., 72 Mg., Rs. 5,40,311.

CALCIUM FLUORO PHOS PHATE: From USA: Ganga Phosphors And Chemicals, 14,800 kgs., Rs. 7,55,106.

CALCIUM OXIDE: From Netherlands: B M Thakkar And Co. P. Ltd., 1,000 kgs., Rs. 7,235.

CAPROLACTAM: From UK: Mazagon Dock Ltd., 2,55,000 kgs., Rs. 62,57,276.

CARBON BLACK: From FRG: JBA Printing Inks Ltd., 1,260 kgs., Rs. 73,405; From FRG: Meghdoot Plastic Corporation, 5.3 kgs., Rs. 1,77,056.

CHLOROFLUMETHANE GAS: From UK: Imkemex India Ltd., 5,640 kgs., Rs. 1,15,330.

COUMARINE: From France: The Tata Oil Mills Co. Ltd., 3,000 kgs., Rs. 5,64,771; From Japan: Orson Electronics Ltd., 2,000 kgs., Rs. 3,76,629.

2 CYANOPYRAZINE: From Japan: Indo Pharma Pharmaceutical Works, 400 kgs., Rs. 2,26,824.

DICHLOROFLUOROMETHANE: From UK: Imkemex India Ltd., 4,100 kgs., Rs. 51,102.

DICYANDIAMIDE: From FRG: Himachem Laboratories, 6,000 kgs., Rs. 1,44,219; 5,000 kgs., Rs. 1,20,182; 5,000 kgs., Rs. 1,19,288.

DIETHANOLAMINE: From Japan: Indian Dyestuff Ind. Ltd., 4,620 Mts., Rs. 59,083.

2,6-DIETHYLANILINE: From Switzerland: Siris India Ltd., 44,460 kgs., Rs. 12,12,888.

DI-2-ETHYL HEXYL PEROXY DICARBONATE: From UK: Indian Petrochemicals Corpn. Ltd., 6,000 kgs., Rs 3,97,594

DIMETHYLAMINO PROPYLAMINE : From FRG : Apuraj Chemicals Pvt. Ltd., 640 kgs., Rs. 42,761.

DIMETHYL BENZYL CARBINYL ACETATE : From Switzerland : Oriental Aromatics, 200 kgs. Rs. 42,273.

DIMETHYL DIPROPYLENE TRIAMINE : From Switzerland : Cibatul Ltd., 3,960 kgs., Rs. 5,97,858.

DIMETHYL SULPHOXIDE : From Japan : Themis Agencies, 2,860 kgs., Rs. 70,048.

DI-OCTYL PHTHALATE : From FRG : Continental Chemicals Corporation, 16,000 kgs., Rs. 1,71,376; From Korea : Prakash Pipes & Industries, 20 mts., Rs. 2,31,076.

DYE INTERMEDIATES : From USA : Colour Chem Ltd., 2,267.96 kgs., Rs. 1,12,350.

EMULSIFIABLE POLYETHYLENE WAX : From Japan : Victor Trading & Engineering, 5 Mts., Rs. 1,00,620.

ETHOXY PROPYLAMINE: From FRG: Jaysynth Dye Chem Pvt. Ltd., 2,040 kgs., Rs. 1,63,227.

ETHYLENE GLYCOL MONOETHYL ETHER: From Kuwait: The National Rayon Corpn., 3.8 Mts., Rs. 40,115; From UK: Chemcrown (India) Ltd., 3,800 kgs., Rs. 45,251; Great Way Pvt. Ltd., 3.8 Mts., Rs. 40,115.

FERRIC OXIDE: From Belgium: Central Electronics Ltd., 20,480 kgs., Rs. 1,15,636.

GLYCINE: From Japan: Southern Sea Foods Ltd., 2,500 kgs., Rs. 1,07,112.

GUM ROSIN: From UAE: Laxmi Board & Paper Mills P. Ltd., 16 Mts., Rs. 1,16,444.

GUM ROSIN N GRADE: From China : Raigadh Paper Mills, 17.55 Mts., Rs. 1,22,122.

GUM ROSIN WW GRADE: From Hong Kong: Rohit Pulp & Paper Mills Ltd., 39.825 Mts., Rs. 2,68,871; From Indonesia: Asian Paints India Ltd., 51,000 kgs., Rs. 3,24,451; Garware Paints Ltd., 51,000 kgs., Rs. 3,24,451.

HEXANE DIOL: From FRG: Jaysynth Dye Chem Pvt. Ltd., 2,327 kgs., Rs. 1,29,422.

HITYEX: From Japan: Futura Packaging (India) Ltd., 16 Mts., Rs. 1,94,699.

HYDROGEN PEROXIDE 50% From Spain: Shree Rang Rasayan 4,200 kgs., Rs. 36,372; 12,600 kgs., Rs. 1,09,116.

8-HYDROXYQUINOLINE: From France: Eskay Fine Chemicals, 1,500 kgs., Rs. 2,95,758; From From Japan: G Amphray Laboratories, 5,000 kgs., Rs. 8,76,369.; Sahi Chemical Institutes, 1,000 kgs., Rs. 1,93,565.

ISOCYANATE : From USA: Godrej & Boyce Mfg. Co. P. Ltd., 113.968 Mts., Rs. 28,11,382.

LAURIC ALDEHYDE: From Switzerland: Oriental Aromatics, 170 kgs., Rs. 48,765.

LINALOOL OXIDE: From Switzerland: Oriental Aromatics, 2 kgs., Rs. 1,289

MAGNESIUM OXIDE: From FRG : Elpro International Ltd., 6.270 kgs., Rs. 1,78,808.

MALEIC ANHYDRIDE: From FRG:: Salvi Chemical Industries, 10,000 kgs., Rs. 1,27,758.

META PHENYLENEDIAMINE : From Belgium: Sunbeam Monochem Pvt. Ltd., 4,500 kgs Rs. 2,90,670.

METHYL BETA NAPHTHYL KETONE : From Switzerland: Oriental Aromatics, 25 kgs., Rs. 11,764.

METHYL DEPEINE CARBONATE: From Switzerland: Oriental Aromatics, 5 kgs., Rs. 8,756.

METHYL ISOBUTYL KETONE: From Taiwan: Jain Enterprises, 13.2 Mts., Rs. 1,54,241.

1 METHYL 4 PIPERIDONE: From Belgium: Bayer (India) Ltd., 1,000 kgs., Rs. 4,00,710.

MOLYBDENUM DISULPHIDE: From FRG: Mobil Lubricants: 500 kgs., Rs. 60,177.

NAPHTHALENE CRUDE: From Egypt: Chemical Devp. & Const. Corpn., 20,000 kgs., Rs. 21,12,656.

NEOPENTYL GLYCOL: From FRG: Dr. Beck & Co. Ltd., 3,000 kgs., Rs. 73,332.

O-NITRO TOLUENE: From FRG: Liberty International Ltd., 14,400 kgs., Rs. 56,088.

ORTHO ANISIDINE: From China: Vibgyor Dyechem, 12 Mts., Rs. 4,08,972.

PARA ANISIDINE: From China: Vibgyor Dyechem, 5.8 Mts., Rs. 2,78,620.

PARAFORMALDEHYDE: From Pakistan: Behari Lal Ganesh Das, 27 Mts., Rs. 1,47,230.

PARA NITROCHLORO BENZENE: From USA: Amphray Laboratories, 19.3 Mts., Rs. 2,81,898; APB Chemicals, 38,356 kgs., Rs. 5,76,354.

PARA OCTYL PHENOL: From Japan : Techno Products (Bombay) Ltd., 7 Mts., Rs. 1,22,691; Unitop Chemicals Ltd., 7 Mts., Rs. 1,22,691.

N-PENTANE: From FRG: BASF India Ltd., 39,000 kgs., Rs. 6,41,899; Indian Petrochemicals Corpn. Ltd., 48.750 Mts., Rs. 8,44,200.

PHENOL: From Japan: Hico Products Ltd., 10,000 kgs., Rs. 1,25,938.

PHENYL ACETIC ALDEHYDE 50%: From Switzerland: Oriental Aromatics, 50 kgs., Rs. 14,091.

POLYACRYLATE: From FRG : Vareli Textile Indl. Ltd., 3 Mts., Rs. 64,042.

POLYVINYL ALCOHOL: From Japan: Indian Petrochemicals Corporation, 5 Mts., Rs. 1,67,744; From Taiwan: Calico Dyes & Chemicals Co., 75 Mts., Rs. 1,46,061; 10 Mts., Rs. 1,94,749.

POTASSIUM CARBONATE: From France: Indmag Pvt. Ltd., 19,200 kgs., Rs. 1,22,12,900.

POVIDONE IODINE USP: From USA: Wockhardt Ltd., 2,000 kgs., Rs. 4,07,629.

N-PROPANOL: From USA: Alembic Chemical Works Co. Ltd., 13.2 Mts., Rs. 1,17,379; Gujarat Themis Boisyn Ltd., 13,200 kgs., Rs. 2,31,361.

PROPYLENE GLYCOL USP: From USA: KEC International Ltd., 8,385 kgs., Rs. 90,358; 96,770 kgs., Rs. 1,80,716.

SODIUM ERYTHORBATE: From Japan: Hindustan Breweries & Bottling, 300 kgs., Rs. 21,033.

SODIUM HYDROSULPHATE: From Belgium: A P Chemicals, 17.000 kgs., Rs. 2,30,692.

SULPHUR: From Kuwait: Shree Siddeshwari Sulphur Prod., 2,000 Mts., Rs. 31,19,088.

SURFACE ACTIVE AGENTS: From Japan: The Baroda Rayon Corporation Ltd., 1,710 kgs., Rs. 2,06,211.

SYNTHETIC HYDROCARBON RESIN: From Japan: Chetna Polycoats (P) Ltd., 2,000 kgs., Rs. 39,988.

SYNTHETIC NITRILE RUBBER: From FRG: Precitex Rubber Industries, 15,000 kgs., Rs. 2,92,-123.

TARTARIC ACID: From Italy: Vimpex Dye Chem Pvt. Ltd., 20,-000 kgs., Rs. 6,67,103.

THORIUM NITRATE: From Indonesia: Universal Polymers, 1,900 kgs., Rs. 1,67,278.

TITANIUM DIOXIDE RUTILE GRADE: From Italy: Garware Paints Ltd., 16,000 kgs, Rs. 4,58,049; From UK: Seaking Marine Services, 4,000 kgs., Rs. 1,11,857.

TITANIUM TRICHLORIDE: From Japan: Indian Petrochemicals Corpn., 4.495 Mts, Rs. 4,18,315.

TOLUENE DIISOCYANATE From Belgium: Jain & Jayna Foams P. Ltd., 6,250 kgs., Rs. 1,74,461; From FRG: Sumangal Chemicals, 1,000 kgs., Rs. 27,-914.

TRIETHYL ORTHO ACETATE. From USA: United Phosphorus Ltd., 800 lbs., Rs. 57,126.

TRIETHYL PHOSPHATE: From FRG: Ashok Organic Industries Ltd., 3,080 kgs., Rs. 1,35,578.

TRIMETHOXY BENZALDEHYDE: From China: Med Concepta Laboratories, 160 kgs., Rs. 38,093.; From Japan: Chetha Polycoats (P) Ltd., 200 kgs., Rs. 49,336.

3,4,5 TRIMETHOXY BENZAL DEHYDE: From FRG: Rajnikant & Co., 1,000 kgs., Rs. 2,98,615.

VANILLIN P: From USA: Emjak Industries Pvt. Ltd., 2,000 kgs., Rs. 3,20,636.

Plastics Materials Imported

BOMBAY
(From 25-1-88 to 28-1-88)
(Cost of Imported Item is CIF Value)

HDPE : From Canada : Agradoot, 12.5 Mts., Rs. 1,02,009, From Japan : Gujarat Packaging Inds., 10 Mts., Rs. 1,20,479 : J.B. Bindal Silk Mills P. Ltd., 51,450 Mts., Rs. 6,07,869, From Iraq : Anjani Haresh, 12.5 Mts., Rs. 1,02,009; From Yugoslavia: Panorama Plastic Industries, 50 Mts., Rs. 5,34,256.

LDPE: From Brazil: Indian Petrochemicals Corpn., 2450 Mts., Rs. 2,73,2,875 From Yugoslavia: IPCL Ltd., 2000 Mts., 2,87,60,905.

POLYPROPYLENE : From Australia : C.L. Jain Hosiery Mills, 14 Mts., Rs. 1,60,797. VST Industries Ltd., 15,000 kgs., Rs. 2,48,305. From Brazil : Zarhak Enterprises, 14 Mts., Rs. 1,60,797; From Czechoslovakia; Kalpesh Plastic Industries, 14 Mts., Rs. 1,60,797. 28 Mts., Rs. 3,24,416. Naresh Paper Bag Co. 14 Mts., Rs. 1,62,208. 42 Mts., Rs. 4,82,391; From Japan : OM Electronics, 14 Mts., Rs. 1,60,-797. From USA : Garware Wall Ropes Ltd., 255 Mts., Rs. 40,39,088.Hemie Poly Oxygen Pvt. Ltd., 15 Mts., Rs. 2,47,331.

POLYSTYRENE HIGH IMPACT GRADE : From Japan : Vijay Electricals Pvt. Ltd., 51 Mts., Rs. 9,41,226.

POLYSTYRENE RESIN: From Japan: Zuari Agro Chemicals Ltd., 102 Mts., Rs. 19,13,294.

POLYSTYRENE RESIN GENERAL PURPOSE: From France: The Indian Farmer Fert. Co. Op., 25 Mts., Rs. 4,47,178: From UK: Reliance Inds. Ltd., 25 Mts., Rs. 4,47,178.

PVC RESIN: From Tanzania: Hasmuthlal Damji & Co., 2.125 Mts., Rs. 31,512.

POLYURETHANE FOAM: From Australia: Wellman (H) Pvt. Ltd., 7540 kgs., Rs. 35,927.

PVC RESIN SUSPENSION GRADE: From Colombo: Kand Iron & Steel Works Ltd., 200 Mts., Rs. 26,47,583; From Iran: Radhev Sons, 300 Mts., Rs. 39,-71,375. From Romania: Orienta Extrusion Pvt. Ltd., 150 Mts., Rs. 18,18,620. Shipra Pipes Pvt. Ltd., 248.25 Mts., Rs. 30,14,-453.

DYES MATERIALS IMPORTED

BOMBAY
(From 25-1-88 to 28-1-88)
(Cost of Imported Item is CIF Value)

SULPHUR BLUE BRN 150% From Japan: Indian Petrochemicals Corpn. Ltd., 1,000 kgs., Rs 40,249.

SULPHUR BORDEAUX 3B From FRG: Jal Pvt. Ltd., 50 kgs., Rs. 32,459.

SYNTHETIC COALTAR DYES TUFF: From China: JP Shah Brothers, 1500 kgs., Rs. 53,55

VICTORIA BLUE 80: Fro China: Sudarshan Chemicals I dustries, 350 kgs., Rs. 1,03,98

DRUGS MATERIALS IMPORTE

BOMBAY
(From 25-1-88 to 28-1-88)
(Cost of Imported Item is CIF Value)

AMPROLIUM HCL: Fro USA: Proful Vitamines, 200 kg Rs. 68,811.

EPHEDRINE HCL: From C na: Lyka Lab Ltd, 260 kgs., R 1,53,171.

IMIDAZOLE: From FRG: Pvt. Ltd., 500 kgs., Rs. 61,67

PEPSIN: From Italy: Baroda Pharma Pvt. Ltd., 250 kgs. Rs. 25,966.

PYRAZINAMIDE BP 80; From Korea: Cadila Chemicals Ltd., 500 kgs., Rs. 2,56,556.

PYRAZINAMIDE BP/USP: From Korea: Trends Pharma: 1,000 kgs., Rs. 5,06,346.

PLASTIC MATERIALS IMPORTED

BOMBAY

(From 28-1-88 to 29-1-88)

(Cost of Imported Item is CIF Value)

DIALLYL PHTHALATE: From Netherlands: Electro Mechanical Switches Ind. Ltd., 100 kgs., Rs. 9,278.

HDPE: From Australia: John Woods Australian High Com., 7.15 Mts., Rs. 2,08,189; From Czechoslovakia: Associated Bros., 100 Mts., Rs. 8,16,072; 12.5 Mts., Rs. 1,02,009; From FRG: Bajaj Auto Limited, 17.5 Mts., Rs. 2,08,189; Jindal Strips Ltd., 12.5 Mts., Rs. 1,02,009; From Iran: Kothari & Co., 68.60 Mts., Rs. 8,32,756; Panchhodas Velgi Thakkar, 17.5 Mts., Rs. 2,08,189; From Iraq: Laxmichand Trikamji Shenoy, 17.15 Mts., Rs. 2,14,870; From Japan: American Embassy, 17.15 Mts., Rs. 2,14,870; Future Packaging (India) Ltd., 16 Mts., Rs. 1,94,-99; Gujarat Packaging Inds., 10 Mts., Rs. 1,20,479; From Pakistan: Haresh Madhavji, 12.5 Mts., Rs. 1,02,009; Jadaldas Damodar Mody Co., 12.5 Mts., Rs. 1,02,009; Kochar Trading Co., 17.15 Mts., Rs. 2,14,870; Grover Overseas P. Ltd., 17.15 Mts., Rs. 2,14,869; 17,150 kgs., Rs. 2,09,303; Jaysingh Packaging, 51,450 kgs., Rs. 6,07,869; Krishna Pack, 17,150 kgs., Rs. 2,14,870; Maradia Plastic, 17.15 Mts., Rs. 2,10,416; Nilkamal Crates And Containers, 51,450 kgs., Rs. 6,37,909, Plastic Processors, 17.15 Mts., Rs. 2,08,-189; Raheja Mercantile Corporation, 17.15 Mts., Rs. 2,09,303; Shri Mahaveer Polyplast Inds., 17.15 Mts., Rs. 2,14,869; Triveni Plastics P. Ltd., 17.15 Mts., Rs. 2,14,870; Universal Lugg. Mfg., Co. Ltd., 34.30 Mts., Rs. 4,16,-378; Vapi Paper Mills Ltd., 74.25 Mts., Rs. 8,08,801; VIP Industries Ltd., 297 Mts., Rs. 36,24,-660; From Singapore: Tayal Agencies, 17.15 Mts., Rs. 2,14,-870; From U.S.A.: Abdullabhai Abdul Kader, 17.14 Mts., Rs. 2,14,869; Ballarpur Industries Ltd., 17.15 Mts., Rs. 2,08,189; From Yugoslavia: Hemant Plastic Industries, 100 Mts., Rs. 10,-81,608.

LDPE: From FRG: Ecoplast Pvt. Ltd., 82,500 kgs., Rs. 10,17,562; From Yugoslavia: Pearl Plast International, 250 Mts., Rs. 30,92,476; Ravi International, 100,000 kgs., Rs. 12,38,000.

LLDPE: From Canada: Mazda Packaging Ltd., 16,000 kgs., Rs. 2,13,964.

POLYCARBONATE: From FRG: Crysclear Containers Pvt. Ltd., 2,700 kgs., Rs. 1,01,659.

POLYBUTENE: From U.S.A.: Savita Chemicals Pvt. Ltd., 12.6 Mts., Rs. 1,17,784.

POLYPROPYLENE: From Canada: Samaj U/D. 19.822 Mts., Rs. 2,05,883; From Czechoslovakia: Associated Plastic Industries, 98 Mts., Rs. 11,25,579; Fibro Plast Corpn., 28 Mts., Rs. 3,21,594; Hardic Industrial Corpn., 84 Mts., Rs. 9,64,782; From France; Garg Furnace Ltd., 14 Mts., Rs. 1,60,797; From FRG. Transfreight Containers Ltd., 14 Mts., Rs. 1,60,797; From Singapore: Anil Plastics Industries, 32 Mts., Rs. 5,69,184; From Switzerland: National Organic Chem. Ind. Ltd., 14 Mts., Rs. 1,60,797; From Turkey, Deepika Enterprises 14 Mts., Rs. 1,60,797 From U.A.E.; Sathe Biscuits & Chocolate Co., 15 Mts., Rs. 2,86,218; From U.S.A. Calcutta Indl. Corp., 15,000 kgs., Rs. 2,37,593.

POLYPROPYLENE: From USA: Caprihans India Ltd., 13.875 Mts., Rs. 2,39,590; Shilpa International, 15,000 kgs., Rs. 2,47,331; Sri Rajshri Plastics, 15 Mts., Rs. 2,37,593.

POLYSTYRENE RESIN: From Korea: Aditya Plastic, 51 Mts., Rs. 9,73,354. Ambadi Enterprises Pvt. Ltd., 30 Mts., Rs. 5,53,-086; 50 Mts., Rs. 9,21,810. Fedders Lloyd Corpn. Pvt. Ltd., 51 Mts., Rs. 9,39,219. Jayshree Industries, 51,000 kgs., Rs. 9,74,109; Rohit Electronics, 17 Mts., Rs. 3,11,208; Selfshine Inds., 17 Mts., Rs. 3,11,209; Standard Plastic Industries, 34 Mts., Rs. 6,22,416; The Supreme Ind. Ltd., 50 Mts., Rs. 9,31,-134.

POLYSTYRENE GENERAL PURPOSE GRADE: From Korea: Amar Plastics, 34,000 kgs., Rs. 6,22,416.

POLYURETHANE RESIN: From USA: International Industries, 2,000 kgs., Rs. 85,430.

PTFE RESIN: From USA: Bombay Fluoroplast (P) Ltd., 23.4 kgs., Rs. 7,675.

PVC RESIN: From Afghanistan: Pritpal Singh, 10 Mts., Rs. 1,12,700; From France: Ferro Alloys Corpn. Ltd., 10 Mts., Rs. 1,12,700; From Korea: The Processed Plastics, 40 Mts., Rs. 5,60,876. From Mexico: S M Industries, 20 Mts., Rs. 2,39,789. From Pakistan: Suresh Bhagwandas, 10 Mts., Rs. 1,12,700; From Saudi Arabia: Ashish Chemo-plast Equipment P. 22.750 Mts., Rs. 28,05,257; From USA: Gopichand Krishan Kumar Bhatia 5 Mts., Rs. 56,350.

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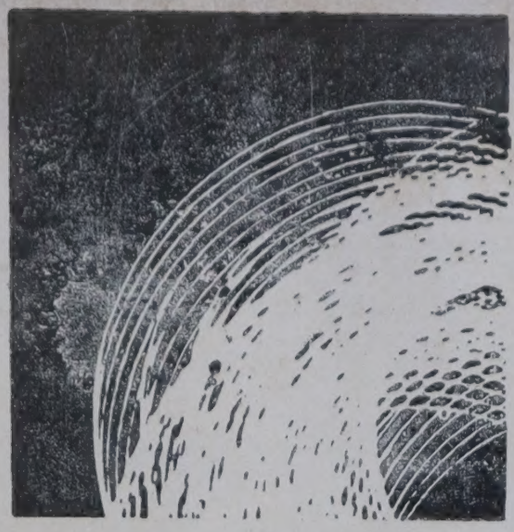

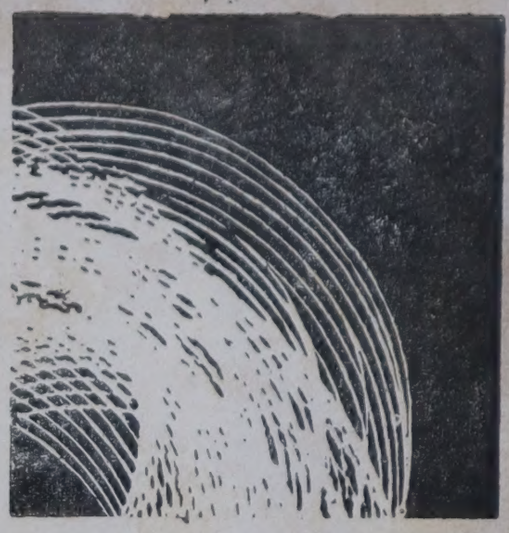

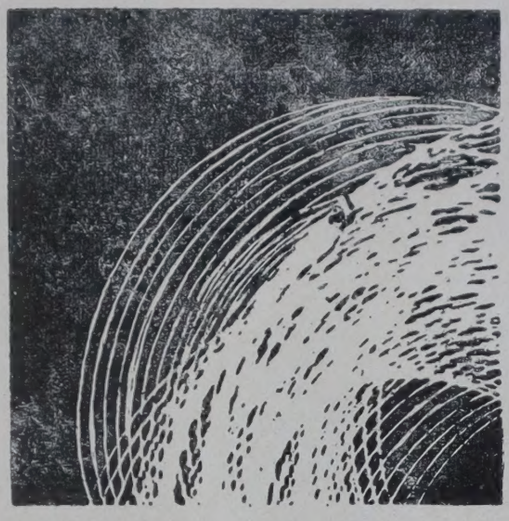

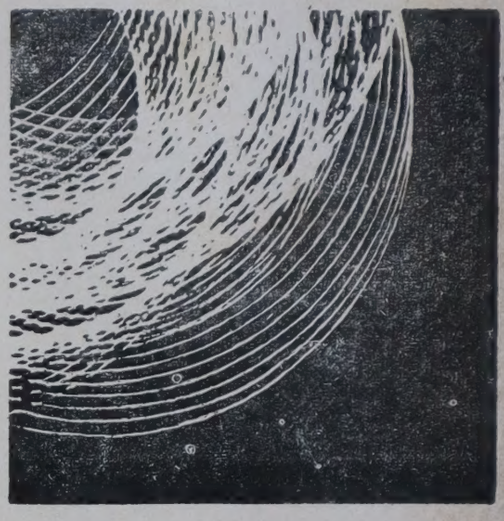

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